Railway Age

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Training in Leadership

THE Cleveland Steam Railway Club opened its fall session this week with a record-breaking attendance in connection with a consideration of the necessity of improving the standards of supervision on the railways. Several facts were strongly emphasized by the many participants in the discussion. The foreman or supervisor must know how to educate and train his men and lead them. No two men are exactly alike or respond in the same way to the same kind of treatment. The supervisor must therefore be a keen student of human nature, in order to understand how to secure the greatest development of and the best co-operation from each individual working under his direction. Here lies one of the greatest opportunities in improving the effectiveness and efficiency of the transportation system. Immediate and determined steps should be taken to train prospective foremen and supervisors in the art or science of leadership; moreover, those men who now hold supervisory positions should be inspired and helped to continue their studies and training in this respect. An important fact which gives great promise for the immediate future, is that many of the foremen recognize the need of such training and are anxious to find some way of securing it. In other words, they are more than willing to help themselves if some reasonable way can be found of securing such information and training. That there are simple, practical solutions of the problem and that a number of groups are experimenting in a variety of ways, so far as the mechanical department is concerned, was pointed out in an extensive survey of methods of training for leadership which was made by the Railway Mechanical Engineer, and published in its June and September issues for the current year. The indications are that the fall and winter seasons upon which we are now entering will be noteworthy because of the advance in improved methods and more widespread attention to the coaching and training of foremen and supervisors in the art of leadership.

Car Loading Averages Million a Week

FREIGHT car loadings for the first 38 weeks of 1926 have averaged over a million cars a week. This interesting piece of news was included in the weekly car-loading report of the Car Service Division of the American Railway Association for the week ended September 18, along with another interesting fact that the loading for that week, 1,187,011 cars, had exceeded all previous records for a week, for the third time this year. Only a few years ago the occurrence of single weeks in which over a million cars were loaded with revenue freight was occasion for comment, but records in freight handling have been going rapidly since 1923. According to the records of the Car Service Division, which include revised and corrected figures for previous years, the first million-car week occurred in August, 1920, and in that year there were five weeks in which the loadings exceeded a million cars. In 1921 and 1922 there were no million-car weeks, but in 1923 the car loadings passed the million mark in the week ended May 23 and there were 21 million-car weeks that year, five of them in the first half of the year. In 1924 there were 10 million-car weeks. In 1925 the first million-car week did not occur until the week of July 18 and there were 20 in the entire year, but the total loadings for the year, 51,177,962 cars, exceeded the total for 1923 by 1,365,849 cars. This year the first million-car week came as early as that ended May 15 and up to September 18 there had been 17 weeks in which the million mark was passed, including six in the first half of the year. The cumulative total for the 38 weeks was 38,068,949 cars, an increase of 1,297,030, or 3.5 per cent, over that for the corresponding period of last year, in which the highest total for a year was recorded. If the increase should merely be maintained for the balance of this year, without any further increase, the total for 1926 would be over 52 million, or an average of over a million a week for an entire year.

One Form of Industrial Waste

SECRETARY HOOVER'S Commission on Waste in Industry found that management was responsible for more of the preventable waste in industry than labor. The Commission's report set under way nation-wide movements for the elimination of waste that have resulted in greater production, lower costs, and higher wages. An annual management week is one of the plans of the Division of Simplified Practice of the United States Department of Commerce, as a means of bringing to the attention of industries the problems of management and the opportunity for progress in that field. Management week will be observed during October, from the 25th to the 30th. This year the theme is Progress in Waste Elimination which is to be demonstrated by a review of the benefits from the nation-wide efforts, over the past five years, to reduce waste in production and distribution. Like all other industries, the railway industry is a contributor to economic waste. One form of waste in the railway field is lost motion from the use of old machine tools. No keen master mechanic or shop superintendent would permit lost motion if he recognized it as such, but often he fails to recognize the fact that the use of old machine tool equipment is nearly all lost motion. Not, necessarily, that there is any waste motion in the functioning of the out-of-date machine tools, but new equipment may be so superior that the old method, by comparison, becomes nothing but preventable waste. Many such uneconomical machine tools and methods are found not only in shops of the vintage of 1900, but in shops of the vintage of 1920, which are

looked upon to be the modern repair shops. Railway managements should heartily join in the spirit of the movement for waste elimination and make every machine tool that has seen ten or more years of service prove itself an economical unit.

Importance of Surplus Railroad Capacity

PROBABLY nothing else could occur which, under existing conditions, would do the railways so much harm as a real and widespread "car shortage."

That it is not premature to consider the effects that would be produced is indicated by the statement recently issued by M. J. Gormley, chairman of the Car Service Division of the American Railway Association, warning railways and shippers that "the supply of surplus serviceable freight cars is practically exhausted." He especially called attention to the fact that in September the supply of surplus open top cars was only about equal to the average number of such cars loaded daily. During the week ended September 14, the latest for which statistics are now available, the surplus of open top cars was larger than at the same time in 1923, but much smaller than in 1924 or 1925. In the corresponding week of 1924 it was 84,200, and in 1925, 60,000, as compared with about 35,400 in 1926. The total car surplus in the week mentioned in 1924 was over 167,000; in 1925, over 160,000, and in 1926, about 137,400, which also was less than the average number of cars loaded daily.

Mr. Gormley appealed to the railways and shippers to handle cars as efficiently as possible. Undoubtely their loading, unloading, switching and road movement can be further speeded up. It is owing only to the improvement in their distribution and the increase in the speed of handling them that have been secured within the last three years that a general car shortage is not being reported now.

The reasons why, under present conditions, the development of a car shortage would do the railways very great harm are plain. The industry and commerce of the country have become adapted to the "hand to mouth" buying which has been made possible by the adequate, speedy and dependable railway service of recent years. Almost every business concern in the country would soon find itself embarrassed by inadequate inventories of finished products, raw materials or fuel if the railways should become unable to continue to render the kind of freight service they are now rendering. The newspapers for months have been publishing glowing reports regarding the increased prosperity of the railways. These reports have been, as to many roads, exaggerated, but a large part of the public does not realize this. The public repeatedly has been told that good earnings by the railways are necessary to enable them to continue to give good service, which, of course, has implied that, if good earnings were made, good service would continue to be rendered.

In the circumstances, it is plain that a car shortage in the future of substantial proportions would have an extremely bad effect on public sentiment. And it should not be overlooked that the railways and Shippers' Advisory Boards already this year have had to make rather heroic efforts to furnish enough cars to handle certain classes of commodities. First, great difficulty was experienced in handling the wheat crop of the southwest. Secondly, only by the most careful planning and the greatest exertion has it been possible thus far to make the supply of refrigerator cars adequate, especially for handling the California grape crop. And now the large coal movement, which has been augmented by exports due to the British coal mine strike, has almost wiped out the surplus of serviceable open top cars.

The railways for more than three years constantly have reported large surpluses of locomotive and freight cars. Railway financiers and officers no doubt have looked askance at these surpluses. They have reflected investments in equipment upon which apparently no return was being earned. In consequence, in 1925 and thus far in 1926 the numbers of locomotives and freight cars purchased and placed in service have been comparatively small and the surpluses of equipment have been steadily declining. Apparently the railways will get through the rest of this year without any very troublesome shortage of facilities. A very important question that needs to be considered, however, is the amount of planning, effort and capital expenditure that should be made to maintain surplus railway capacity in the future.

The success of the railways in rendering such good freight service within recent years has been due to the fact that until recently, owing to enlargements of their physical plant, improvements in operating methods and co-operation with shippers, their capacity has increased more rapidly in proportion than traffic has grown, with the result that at all times they have had surplus capacity. The maintenance of surplus capacity costs money. Fixed charges, and to some extent expenses of maintaining equipment and other facilities, go on whether the facilities are being fully utilized or not. It seems plain, however, that, from the standpoints both of railway economics and of the effect upon public sentiment, the provision of sufficient railway capacity at all times to meet the maximum prospective demands of traffic is a sound policy. If there is to be ample capacity to meet maximum demands there must be substantial surplus capacity most of the time and some surplus capacity at all times.

Inadequate capacity means a loss of gross earnings and an increase of operating expenses as long as it exists. Furthermore, inadequate capacity, even for a short time, results in congestions and "car shortages" which incense the public. Past experience has shown that nothing else makes it so difficult to get farmers and business men to listen to a reasonable discussion of railway regulation as a car shortage, and that likewise nothing else helps so much to win public favor as the rendering of good and adequate service.

Nobody can foresee how long the increase in freight business will continue or how large it will become. Since last spring it has exceeded the expectations of most students of business and transportation conditions. Almost throughout this time the outstanding orders for new freight cars have been declining. The number of new cars on order in January was almost 50,000, and in July less than 28,000. Orders for locomotives have been larger than last year, but not relatively large. Each railway makes improvements in its fixed properties and buys equipment according to its own anticipated needs. The public, however, looks to the railway system of the country as a whole to furnish it satisfactory service. This being the case, it appears that it might be desirable for the railways, through some organization representing all of them, such as the American Railway Association, to make a general survey from time to time not only of probable future traffic, but also of the increase in the capacity of the country's railway system as a whole and by territories that will be re-

quired to enable it satisfactorily to handle the traffic that can reasonably be anticipated.

At any rate, it seems clear it would be a very serious mistake for the railways to fail to make every reasonable effort to maintain at all times some surplus freight carrying capacity. The duties of the regulating authorities and the railways with respect to this matter are complementary. It is the duty of the former to let the railways earn enough to provide adequate capacity. It is the duty of the latter to make sure adequate capacity is provided if they are allowed to earn enough.

What Dividends Should Railways Pay?

THERE have recently occurred, or are reported as in prospect, some interesting developments that may throw light on the question of what dividends the railways must pay in order to be able to finance more largely by the sale of stock. One of these is the recent advance in the dividend rate of the Baltimore & Ohio from 5 to 6 per cent. Another is the reported intention of the Southern Railway, which is paying 7 per cent, to try to raise capital by offering for sale a substantial amount of common stock.

Recent quotations of railway securities on the Stock Exchange might be taken to indicate that numerous railways could now sell their stock to the public well above par. A recent statistical study of all the dividend-paying railway stocks quoted in one day showed that the average yield upon them at the dividends being paid and at the market prices quoted on that day was only 5.13 per cent. Close scrutiny of the statistics regarding the stocks of individual roads indicated, however, that in almost every case in which there seemed obviously to be no prospect of an advance in the dividend, the stock was selling on a basis that would yield the purchaser more than 6 per cent. In other words, in one case the dividend upon the par value of the stock might be 5 per cent, and in another it might be 10 per cent, but, regardless of the difference between the dividends being paid, if the earnings on the stock or other circumstances were such as to indicate no prospect of an advance in the dividend, the stock almost invariably could be bought at a price which would yield the purchaser more than 6 per cent. The high prices at which many stocks have been selling evidently have been due to the hope on the part of those buying them that the dividends would be increased.

The changes that have occurred in the market price of Baltimore & Ohio common indicate the same general situation. The earnings upon this stock in 1925 were about $12.50 a share. Thus far in 1926 they have been at the rate of more than $15 a share. There has been talk for a long time about an advance in the dividend to 6, or even 7, per cent. While the advance in the dividend rate was still in prospect the price of the stock advanced to almost $110 a share. Very soon after the dividend rate actually was made 6 per cent the price of the stock declined to less than $102. Southern Railway common has been selling for around $125 a share; but in the newspaper report that new stock was to be sold to the public it was stated that when this report was received on the Stock Exchange the price immediately declined $2.

It is an old story that the prices at which securities change hands on the Stock Exchange are no real measure of the prices at which a substantial amount of new stock can be sold. Stock market prices are largely, or mainly, speculative. Only a very small part of all the stock that a railway or industrial concern has outstanding actually changes hands in the course of a year. The large fluctuations in the prices of those that do change hands are mainly due to ephemeral conditions and to the opinions of a comparatively few persons which are based upon the prevailing trend of interest rates, temporary increases or decreases in earnings per share, gossip about possible or probable changes in dividend rates, and anticipated upward or downward swings in the general market.

The real question to which an answer must be sought when the issuance of a large amount of new stock is under consideration is not what a comparatively few persons who are speculating on the stock market will pay for a small amount of stock, but how much yield the great investing public will demand upon securities which it buys for the purpose of putting away permanently in its strong box. The only way to determine that is to issue new stock and see what effect its issuance will have on the market price. Almost invariably its issuance will cause a substantial decline in the market price.

There are railways which are paying 7 per cent dividends whose stock is selling for from $125 to more than $200 a share. In spite of this, it seems extremely doubtful whether, even under present favorable market conditions, railways could sell any substantial amount of stock at par or above upon which a dividend of less than 7 per cent was already being paid. And, of course, the present market is a "bull market," which is sure to be followed sooner or later by a "bear" market. The railways should do more financing by the sale of stock, but if they are to do so they must get the investing public, and not merely speculators, to buy the stock, and general financial and business conditions seem to indicate that real investors will demand reasonable assurance of a return of approximately 7 per cent.

Getting Started Right

FEW movements in the railway field in this country and Canada have gripped the interest and imagination of railway officers and workers to a greater extent than the national Younger Railroad Men's Conferences, which were first started at St. Louis three years ago, and which have stimulated a great variety of efforts looking toward the better selection, training and development of the young men in all departments of our railways. It may be well to review a few of the more outstanding results of these conferences.

The passing away of E. W. Grice of the Chesapeake & Ohio reminds us of the series of younger men's conferences which he set up on that system. These were encouraged by the chief executive, Mr. Harahan, and followed up under his personal direction in such a way as to insure a keen interest in the welfare and development of all the young men on that system on the part of the officers and supervisors. The staff of the Transportation Department of the National Council of the Y. M. C. A. is finding itself embarrassed with the number of requests for assistance in putting on similar programs on other systems.

Undoubtedly, also, the Younger Railroad Men's Conferences have had no little part in the revival of interest in the apprenticeship problem and the introduction of more progressive and modern training methods on a number of roads. It is difficult to estimate the far-reaching importance of the AREB (American Railway Employed Boys) Clubs, or similar clubs which have been

organized as a result of the national conferences, and which, incidentally, in many cases, have brought about more intimate relationships and better understandings between the younger men and their superiors. The interest which has been shown in the boys and young men by the railway clubs and the local foremen's and supervisors' clubs, is in many cases a direct result of the Younger Railroad Men's Conferences.

Checks have been made months after these national conferences by getting in touch with the delegates, as well as the older advisers who accompanied the different groups to the meetings, in an attempt to find what practical benefits have resulted. While every effort is made to carefully select the delegates, some mistakes are made. It is gratifying, however, to find the large number of young men who carry back to their local communities some of the inspiration and practical benefits of the conferences. One thing the young men experience, and in some cases pass on to their fellows, is a better and broader understanding of human relationships in railroad organizations and the necessity of more intelligent co-operation with their associates and superiors. Just as Warren King was impressed with this phase of the World's Conference at Helsingfors, as recorded elsewhere in this issue, so the delegates to the national conferences have come to a better understanding of their relations to their fellows, of the importance of the railroads to public prosperity and progress, and of the need of more intelligent and enthusiastic teamwork.

How Can the A. R. E. A. Be Made More Valuable?

"TO see ourselves as others see us" affords a prospect which, while not altogether pleasing, comprises a perspective that frequently discloses defects which have not been brought to light previously. The American Railway Engineering Association has been afforded such an opportunity in the form of observations made by an Oriental visitor at the last convention, which were published by the "Oriental Engineer" and have been reprinted in the association's Bulletin No. 287. The significant statement in these observations is as follows: ". . . constructive criticism was relatively slight. A vast amount of varied information was included in the reports presented, but much of it was simply accepted without remark."

While the same criticism has been offered previously, the fact that it comes from one with a detached point of view lends greater emphasis to it. However, the observer might well have appended to his remarks a statement of the obvious reason for the condition which he criticizes, namely, the crowded program of the convention. It is the very success of the association, the wholehearted interest and enthusiasm of its members and the efforts of the board of direction to meet their demands for active participation in the work, which have given rise to the objectionable conditions cited.

Increase in the membership and in the attendance at conventions, increase in the personnel of committees and the conduct of committee work by sub-committees, have all been potent factors in the development of congested programs. The presentation of each report, even if restricted to a bare outline of its contents, takes a considerable part of the time which can be allotted to the committee during the course of the convention sessions. Moreover, the situation is one of long standing. In fact, it has prevailed for so many years that a considerable proportion of the membership has accepted it without question. This attitude of mind is manifested by a tendency toward a too-ready acceptance of committee reports in toto, frequently expressed in an ill-concealed resentment of protracted or persistent discussion or criticism of committee reports, with the result that nearly all motions offered for the amendment of reports are lost.

This is not a healthy condition. It clothes the standing committees with powers not presumed by the spirit of the constitution, and reduces the deliberations at conventions to a fraction of the importance they should have in the work of the association.

The *Railway Age* is a firm believer in the A. R. E. A. It has repeatedly pointed to this association as almost a model. It believes that the A. R. E. A. has been of unusual value to the railroads of the United States and Canada and that it will continue to render valuable service. There is, however, a definite need for some alteration of the convention program or convention procedure which will afford means for a freer and fuller discussion of committee reports. Various suggestions have been made to this end, such as the lengthening of the convention to four days, a sub-division into sectional meetings, the presentation of individual committee reports in alternate years, etc. It is realized that all of these plans have their disadvantages and furthermore that any plan of procedure which has been marked with success in the past should be changed only after mature consideration. Nevertheless, the problem is one that cannot be ignored and with the approach of the time when definite plans for the next convention must be drawn, it should be attacked with renewed vigor.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Enginemen's Manual, by W. P. James. Revised 1926 edition containing questions and answers on locomotives and air brakes. 463 p. Pub. by W. P. James Pub. Co., Louisville, Ky., $4.

The Financial Policy of Corporations, by Arthur Stone Dewing. Revised and enlarged edition including new chapters on customer ownership and other recent developments, and a section on expansion and industrial, railroad and public utility combinations. 1281 p. Pub. by Ronald Press Co., New York City. $10.

Poor's Railroad and Bank Section 1926. The 59th consecutive annual number of Poor's Manual of Railroads, and also a section on banks and trust companies. 2040 p. Pub. by Poor's Publishing Co., New York City.

Siberia—Its Resources and Possibilities, by Boris Baievsky. In the section "Transportation and Communication," p. 47-52, there is a concise history of the Trans-Siberian and other railways. U. S. Dept. of Commerce. Trade promotion series bulletin No. 36. 69 p. Washington, Govt. Print. Off. 15 cents.

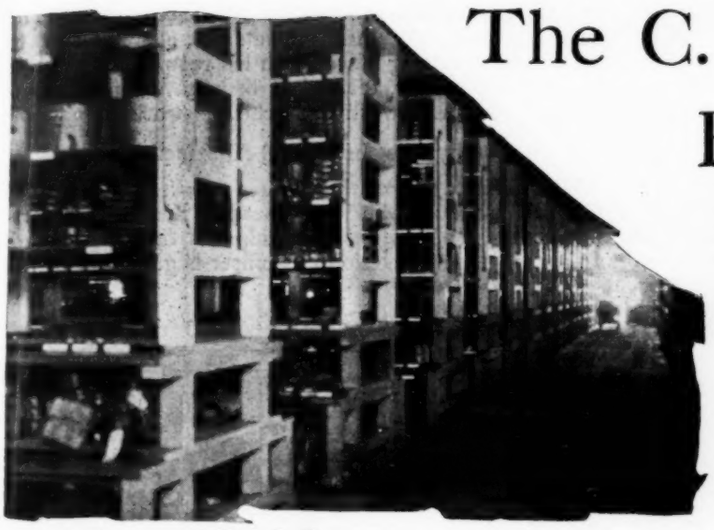
Then and Now—A Review of the Work of the Interior Dept. 1923-1926. Historical sketch, discussion of operating improvements (p. 46-48) of the Alaska Railroad. 52 p. Pub. by Govt. Print. Off., Washington, D. C. Apply to U. S. Dept. of Interior.

Periodical Articles

Canada from the Air, by A. J. Wilson. Profusely illustrated record of the accomplishments in aerial surveying of the Royal Canadian Air Force, which contain the transportation history and problems of the Dominion. National Geographic Magazine, October, 1926, p. 389-466.

Fuel Conservation in the United States Government Merchant Marine Fleet, by Herbert L. Seward. Organization, results, etc. Mechanical Engineering, October, 1926, p. 989-998.

Railroad Taxation. Editorial comment on situation in Virginia. Southern Planter, October, 1926, p. 14.



Storekeeping on the C. M. & St. P.

The C. M. & St. Paul Budgets Its Purchases

Large benefits claimed for practice which drive home idea that material is money

THE Chicago, Milwaukee & St. Paul is now working out a plan of budgeting its purchases which it calls an allotment plan, whereby orders for material must be kept within a predetermined amount each month. This amount or allotment is fixed by the chief purchasing officer and operates through the general storekeeper and the local storekeepers. It has been on trial for over a year and is credited with large benefits, among which is an effectual service in driving home the idea with users of supplies that material is money. It has the endorsement of the using departments.

Trailers Take the Place of Fixed Bins and Racks in the Car Repair Yards for Holding All Working Stocks and Accumulating Scrap

The quickest approach to an understanding of the Milwaukee's budgeting of purchases is the description of the procedure involved. The first step is the preparation of the estimate of requirements. It devolves upon each storekeeper to arrive at an estimated value of the material which he must order during the next month to meet the requirements of the next succeeding month. Thus, in September each storekeeper must determine in money how much must be ordered to meet his requirements of material in November. Again, during October he must determine in money how much must be ordered to meet the requirements of December.

The initial move is to determine the probable requirements. This is accomplished by a study of past consumption and future plans. The Milwaukee's monthly report of material is employed in this connection. This monthly report is the standard material classification of Division VI, American Railway Association, which divides material and supplies into 52 classifications, and gives the value of the stock on hand and the value of the stock used during the month for each of the 52 classifications. There is a separate material statement for each division which enables each storekeeper to ascertain at a glance the value of each class of material carried and used on the division in the same period in previous years. At the larger points where the storekeeping is divided into sections, the stockman in charge of each section is called upon to prepare the preliminary estimates for the classes of stock under his charge. Conferences with the division officers in charge of maintenance of way and construction work and of car and locomotive repairs respectively, then disclose whether the requirements will be greater or less than the consumption in previous years. These conferences particularly disclose the amount and kind of special work to be undertaken.

When the probable requirements have been ascertained the storekeeper's stock book record of stock on hand and on order is a guide to the orders which must be made. The final step in the preparation of the estimate is to differentiate between the material requiring purchase and that which is to be procured by orders on other supply points. This requirement results from the organization of the Milwaukee's supply department into districts, and also the operation of a few stores or yards as general supply points for designated supplies. The importance of distinguishing between the material to be obtained by transfer and that to be obtained by purchase results from the fact that the budget plan is concerned only with the material to be purchased.

Material for Programs Reported Separately

It is provided that the estimates of the various storekeepers shall reach the general storekeeper's office not later than a prescribed day of the month preceding that during which the material is to be ordered. This is usually on or about the 20th of the month in question. These estimates or requests for allotment distinguish between the money for ordinary maintenance, that for

special work scheduled in shops and that needed for material for maintenance of way programs, particularly rail laying. The estimate covering material for ordinary replenishments is divided to show the money requested for locomotive department material, car department material, track material, bridge and building material, signal material, foundry material, station supplies and miscellaneous. The requested allotment for ordinary replenishment is further divided to give the amount of material that will be obtained by transfer from designated points and the amount to be obtained by purchase. A typical storekeeper's request for allotment is shown in one of the illustrations.

Division storekeepers submit their requests to their respective district storekeepers, who in turn forward the requests to the general storekeeper. The district storekeeper, on receiving the original request from the division storekeepers, uses this as the basis of estimating what he will have to purchase to protect divisions in his district.

General Storekeeper Prepares System Allotments

When the requirements of the various storekeepers are received it becomes the general storekeeper's responsibility to examine each one for the purpose of making such reductions in the estimates as he thinks it is possible to accomplish from his general knowledge of supply conditions and from his more comprehensive information of the maintenance of way and mechanical programs. In this examination he may or may not communicate with the storekeepers in question. Eventually the several estimates for ordinary replenishment are consolidated and statements prepared, one showing the total purchase allotment requested for each division and another giving the information by departments. The general storekeeper then submits these statements to the chief purchasing officer with his request for a single allotment of money, divided as between ordinary maintenance, A. F. E. work and schedule work, if any.

ALLOTMENT FOR MATERIAL
To be Purchased in August for Use in October

Maintenance	August 1926	Last Month (July 1926)	Last Year (August 1925)
Locomotive Department			
Car Department			
Track Department			
B. & B. Department			
Signal Department			
Milwaukee Foundry			
Stationery			
Stations			
Telegraph Department			
Electrification			
Miscellaneous			
AFE Material			
Total			

Estimate of Material That Will be Received and Invoiced

	August 1926	Last Month (July 1926)	Last Year (August 1925)
Coal			
Fuel Oil			
Rail			
Ties			
Ties (Treatment)			
Commissary			
AFE Material			
Maintenance Material			
Commitments: Track Fastenings, Lumber, etc.			
Total			

Requisitions and Invoices Passed

	Last Month (July 1926)	Month Previous (June 1926)	Last Year (August 1925)
Maintenance Material Allotment			
Requisitions Against Allotment			
AFE Material Allotment			
Requisitions Against Allotment			
Estimated Invoices to be Passed			
Actual Invoices Passed			

A Page from the Budget Book Showing How the Allotments are Classified and Their History Kept

Payrolls Influence Allotments

The ultimate size of the allotment rests upon the chief purchasing officer who is also head of the stores department and responsible for all supplies on the railroad. In arriving at his decision this officer is guided primarily by the probable size of the payroll for the various departments for the month during which the material is to be required, which is compared with the payrolls of preceding months, and particularly those for the same period in previous years. The system payroll, less the salaries of general officers and traffic department expenses, is employed for this purpose, also the payroll of the mechanical department. This reliance upon the payroll as a guide in determining the allotment results, first from the fact that on the Milwaukee it is the practice of the management, under an operating budget plan, to prescribe in advance of each month what each department and division will be allowed to spend for labor and second, because substantial increases or decreases in the payroll allotments will increase or decrease the consumption of material.

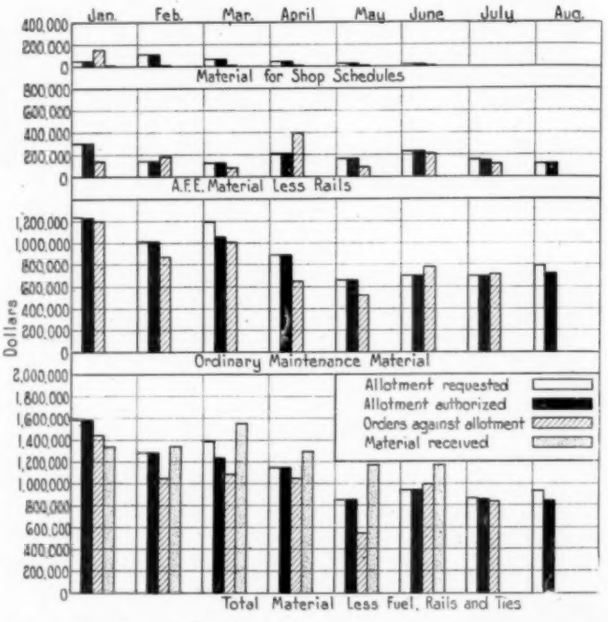


Chart Showing Comparisons Between Allotments Requested, Allotments Authorized, Orders Placed and Material Received

Keep Daily Record of Orders Against Allotment

The statement furnished by the general storekeeper with his request is also serviceable in determining what the allotment should be, together with the data on file of previous supply conditions for the system. Much of the latter, including monthly payroll figures, is prepared on charts which are all contained in a single loose-leaf binder instantly accessible for determining trends. In addition, the general storekeeper is close at hand if a conference is desired in arriving at the final decision.

The general storekeeper learns what the final allot-

ment is to be during the last week of the month. Revisions in allotment requested are then prorated over the several divisions and each storekeeper must then revise his own estimates accordingly to determine what the distribution shall be among the several classes of material or departments to be supplied. This work is timed so that each storekeeper and each section stockman, if need be, will have his allotment by the beginning of the month covered, whereupon it becomes the duty of each to avoid overrunning his allotment when placing purchase orders.

It is the practice for each storekeeper to keep a record of the total value of all purchase requisitions issued each day, which record also shows the total value of all requisitions placed during the month up to the day in question. In the district stores, which are organized on the sectional plan, with a sectional stockman in charge of designated classes of stock and where the allotment is divided by classes, a separate report is kept for each class, as well as a consolidated report for all classes. The general storekeeper keeps a record of the purchase requisitions for

Every Bin in the Milwaukee Stores Carries the Price of the Stock

the system, which it is easy to do, since all such requisitions are received in the office of the general storekeeper before passing for purchase.

With this record of requisitions placed, each storekeeper and the general storekeeper can see day by day the progress of purchases and take proper steps to avoid exceeding the allotment, which it is possible to do by making readjustments in the allotment among the several classes, where the requisitions in one class will permit a reduction in the allotment for the benefit of another class. If an overrun is unavoidable, a request must be made for an additional allotment with a proper explanation. The process of determining the value of the requisitions placed in each class each day is simplified by reason of the fact that each purchase requisition is confined to one class of material and also because for ordinary replenishments. certain days are designated for ordering each class of material.

At the close of the month, the general storekeeper prepares a statement which shows the total allotment authorized for the month for maintenance materials, the value of the orders placed for such material during the month and the increase or decrease, while similar information is also furnished with reference to material called for on A. F. E. orders and for schedule work. In the purchasing office a statement is also prepared showing the estimate of invoices to be passed during the month, covering material delivered during that month and the value of the actual invoices passed. These records furnish a measure of the efficiency with which the allotments were prepared and followed.

Budget a Means of Stock Control

The plan is pictured as a needed refinement of stock control. From the beginning of the war and particularly since its close, numerous changes have been instituted in the Milwaukee's supply situation which were calculated to benefit the company in this respect, among others. One of the first changes was the adoption of the practice of keeping supplies on the books of the supply department until their application,—to avoid excessive accumulations of serviceable material. The jurisdiction of the supply department over the material was also extended, for the benefit that would come from its custody by persons primarily interested in material. The company also adopted the standard classification of material and a system of standard stock books, and the district storehouse were reorganized on the sectional plan with sectional stockmen in full charge of designated classifications of material. These changes were effected by 1922. During the same period and since that time considerable attention has been given to the improvement of storehouse interiors and to the rearrangement of material,—daylight shelving, unit piling, island platforms, etc., comprising some of the physical changes made in the interest, largely, of better stock control.

Material Is Money

It has been a theory in the supply department of this road, however, that while better facilities and systems for storing and handling material are essential to efficient stock control, complete success is impossible without injecting the money idea of material into the scheme and of forcing the user as well as the supply men to look ahead. The time for action, it is contended, is before material is bought, not after.

Largely for the purpose of getting men to appreciate the value of material, this road inaugurated a system of bin pricing several years ago, according to which every bin or shelf in the Milwaukee stores is placarded with the unit price of the article contained, and the practice is followed of requiring these prices to be kept up to date by the stock man in charge and utilized in all cost determinations. That this system, in the development of which the Milwaukee is a pioneer, has been effective upon those who use material as well as upon those who handle and distribute it, is illustrated by the incident wherein a shop man seeking a certain bushing instantly decided to repair the old one when confronted with the information that the new bushing would cost upwards of $80 when, to his own knowledge, the old one could be repaired for less than $10.

The budget plan, it is argued, carries the process a step further by enforcing this recognition of the money value of material and in operating as an effective means of bringing the supply officer and user in closer contact at a period when the influence of increasing complexities of railway operation is rather to force them apart. Thus, under the budget plan, the storekeeper, confronted with the necessity of keeping his orders within a prescribed figure, is forced to maintain a close contact with the user in order to anticipate correctly

what he must provide, while the user, on the other hand, realizing that there is a limit on expense, is forced to outline his future requirements more accurately or suffer the embarrassment of explaining why he did not. There is no operating expense budget on the Milwaukee which allots the *expenses* of the several departments for material, but it is contended that the merit of the argument would not be diminished by the adoption of any operating expense budget that would include material as well as labor.

Budget Enforces Co-operation

The Milwaukee's budget plan was made effective over the system a year ago after trial on a few divisions during the two years previous. The going was hard at first but through the earnest co-operation of all departments, the plan is now working reasonably smooth. Users have been responsive to warnings from storekeepers that allotment limits are being approached. What has happened on some of these occasions is significant. For instance, a master carpenter issued a single order for a large number of rolls of roofing paper, but when told that the placing of this order would jeopardize his chances of getting orders placed that month for other material that he might need, he discovered that, after all, he needed to order only a third of the paper during the month in question. In another instance, suggesting that users often have an inducement to co-operate in the work, a master mechanic found that by saving in other material it was possible to secure tools which he had needed but could not secure if the allotment were overrun.

Allotments Seldom Overrun

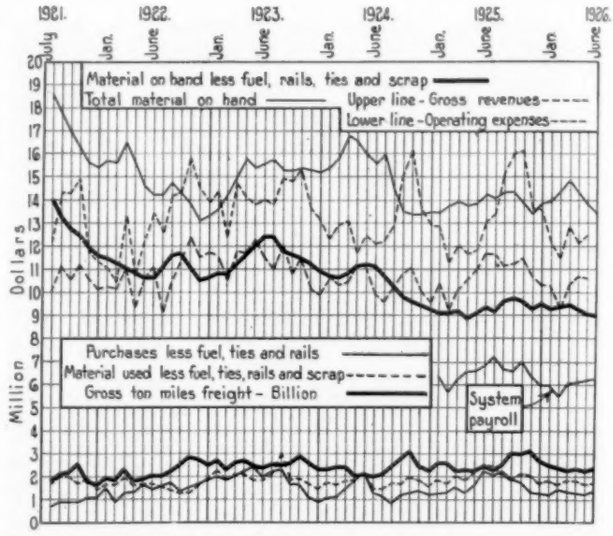
The accompanying charts for shop schedule work, for A. F. E. work, for ordinary maintenance work and for the total material involved show the operation of the allotment plan during the present year. The first column in each group represents the amount of money requested for the system, while the second column shows the amount of money authorized and the third column, the total value of the purchase orders placed against the allotment.

The chart of the schedule material is disregarded because of the small amount of work carried on during the year. The chart for the A. F. E. allotments covers all material for such work except rail. It will be seen, first, that no reductions were made in the allotments requested for this material. This, it is explained, follows because under all circumstances material for A. F. E. work must be procured and the purpose in this case is rather to get storekeepers to keep closely in touch with these programs. That difficulty is encountered in anticipating the A. F. E. work, however, is brought out by the relation of the columns showing the value of orders placed to those showing the allotments. Considerable variation is apparent, although in recent months the orders placed for the A. F. E. materials were below the allotments. It is pointed out, however, that the programming of purchases for A. F. E. work at the present time is far from satisfactory because of the necessity of depending largely upon conjecture in determining the requirements.

The allotment plan was primarily directed to control the material used in ordinary maintenance, which material forms the bulk of all expenditures. This chart, like the preceding, also shows little variation between the volume of the allotment requested each month and the volume authorized. In only two months were substantial reductions made in the allotments requested.

In February, an allotment was requested for locomotive upkeep, but because of word received of a contemplated reduction in the payroll of the mechanical department, this allotment was reduced. In August a reduction was was made because it was felt that conditions were not sufficiently different from those in the preceding month to justify the greater allotment requested. The chart does not disclose what reductions were made in the original request by the general storekeeper but it is pointed out that reductions have been made regularly at this stage. Only two cases are disclosed where increased allotments have been requested during the current year to cover additional materials.

With reference to the value of the orders placed, the chart shows that in all cases but two the value of orders placed this year have been under the allotment. One practice that is followed to avoid over-running allotments is that of the general storekeeper to hold a slight percentage of the system allotment in reserve each month when parceling out the authorized allotment to the various supply points. The principal overrun of the



Trends of Supplies Carried, Purchases and Consumption in Relation to Traffic, Revenues and Operating Expenses

allotment for ordinary maintenance work during the year occurred in June.

In the chart involving all the material and supplies ordered during the month under the allotment plan, a fourth column has been added to show for each month the actual expenditures during that month for material, as determined from the bills paid for material received at supply points, as distinguished from the value of orders placed.

Reduction in Stock

It is also interesting in connection with a study of this working plan to see the trend of supply conditions over a period of years which is disclosed by the curves.

One of these curves shows the total stock on hand for each month since 1921, another curve shows for the same period the storehouse or ordinary maintenance stock, comprising all materials and supplies except fuel, ties, rail and scrap. A third curve shows the purchases of material immediately covered by the allotment plan, comprising all material less fuel, ties, rail and scrap. A fourth curve shows the consumption of this material, while a fifth curve gives the gross revenue per month,

a sixth curve, the monthly operating expenses, a seventh curve, the gross ton miles of freight carried, and the eighth curve, the system payrolls less the salaries of general and traffic department officers. The particularly interesting things about these curves are, first, the reduction in maintenance materials carried in stock from $14,000,000 in 1922, to approximately $9,000,000 at the present time, and, second, a level of purchases for ordinary maintenance below the consumption in the face of an increase in revenues, operating expenses and gross ton miles. The trends during the last year are not sufficiently different from those which prevailed immediately before the allotment plan to bring out the positive influence of the plan but it is felt on the Milwaukee that this plan has contributed to maintain this downward trend in stock on hand and purchases. In the case of stock on hand, of course, it is

ESTIMATE OF MATERIAL REQUIRED BY PURCHASE AND TRANSFER

August 1926

	From Purchasing Agent	From Milwaukee District Store	From Savanna Rail Mill	From Tomah Shops Store	Total Allotment
Loco Dept.					
Car "					
B. & B."					
Track "					
Signal "					
Agents					
Miscellaneous					
Total					

A Typical Form of the Local Storekeeper's Original Estimate of Material Required, Showing Material to be Obtained by Purchases and Also by Transfers from Other Stores

true that with continued reductions, the point is eventually reached where further reductions become increasingly difficult to obtain.

Perhaps the most striking reaction to the plan comes from the head of one of the using departments, who remarked upon the better service that had been obtained from the supply department in the last year, with which is to be considered the contention of the supply officers, on the other hand, that from their standpoint the plan secures better co-operation from the using department.

No Arbitrary Cancellation of Orders Under Plan

Aside from its effect in accomplishing its immediate and primary aim, there is under the Milwaukee plan no arbitrary cancellation of purchase orders as where, for one reason or another, authorities take action on requisitions without the knowledge of the parties originating them. It is pointed out that under the plan any curtailment of expenditures is made known before the orders are placed and not after the orders have been issued.

It is emphasized, finally, that the allotment plan is primarily only in a nature of a refinement on stock control and neither interferes with nor diminishes the importance of the stock book in avoiding excess stock as well as the necessity of storekeepers justifying all requisitions. As far as this phase of the work is concerned the conditions remain unchanged, every requisition having to justify itself to an equal extent as before, and the stock on hand being constantly studied with a view to the possibilities of its further reduction. The cost of the plan, it is contended, is not appreciable, the entire process requiring only a small amount of time and no additional force having been required to render it operative.

Shippers Asked to Economize in Use of Cars

WASHINGTON, D. C.

POINTING out that the supply of surplus serviceable freight cars is "practically exhausted," having been reduced to an average of 137,377 cars in the week ended September 14, M. J. Gormley, chairman of the Car Service Division of the American Railway Association, has addressed a circular letter to members of regional advisory boards, shippers, receivers and the public generally, appealing to them to give especial attention to their handling of cars during October and November to reduce the time cars are held by the public. The railroads have also been asked to give especial attention to improving the movement of cars. Mr. Gormley's letter follows:

Freight car loadings, as you know, are running heavier than ever before. For 19 consecutive weeks, with the exception of two holiday periods, the total has exceeded a million cars per week, and for the week of September 18th, the loading for the third time this year has exceeded all previous high records.

The supply of surplus serviceable freight cars is practically exhausted. This condition is particularly marked in the case of open top cars, the average daily surplus of which is now only 33,039 cars, a figure less than half an average day's loading of this class of equipment. The loading of commodities usually handled in open top cars, particularly ore, sand, stone, gravel, steel products, etc., is much heavier than ever before. In spite of the extraordinary demand for open top cars the railroads up to date have generally met the situation practically without shortage but with the prospect that the requirements will continue at the present rate, or in excess thereof, this record can only be maintained by extraordinary efforts to improve, if possible, the present good record.

1st—In the movement of such cars by the railroads; and

2nd—In the reduction of the time cars are held by the public.

The attention of the railroads has been called to the importance of the first item, and the purpose of this letter is to appeal to the members of the Advisory Boards and shippers generally to assist by giving special attention to their handling of these cars, especially for the next sixty days—

1st—By unloading cars within the free time, and within the first day of placement, if possible;

2nd—By not ordering cars in excess of immediate requirements.

Let the slogan *"No Demurrage Accruals During October and November* 1926" be adopted by every shipper and receiver in the country.

With this program worked out successfully through joint cooperation on the part of the shippers and the railroads it can be stated as a positive fact that there will be no shortage of cars experienced during the anticipated heavy loading period of the next two months.

While this letter deals primarily with the open top car situation it is also important to expedite the handling of other classes of equipment, particularly box and refrigerator cars, if continued demands are to be met successfully.

L. M. Betts, manager of the closed car section of the Car Service Division, has addressed the following mailgram to the railroads:

Present unprecedented car loadings have reduced closed car surplus everywhere to the vanishing point and conditions justify rigid supervision over car handling to insure best possible service every available car.

Automobile loading Michigan and adjoining territory increasing and car supply becoming short. Urgent request from that District for expeditious return automobile cars to owners.

Heavy cotton and lumber loading in Southeastern and Southwestern territory running all lines short and necessary that special attention be given prompt return of cars belonging to such roads. If you have any surplus serviceable box cars available for delivery to connections, please advise promptly and will endeavor to find immediate outlet.

Live stock loading in West increasing rapidly, with particularly heavy sheep movement from Western ranges. Stock cars of all descriptions must be handled promptly and cars of Western roads expedited to home lines.

Railway Equipment Problems*

Including consideration of engineering and research as well as the utilization of the equipment and its maintenance

By F. H. Hardin
Assistant to President, New York Central, New York

ATHLETIC competition can teach much that is useful in any business field, principal of which are; sportsmanship, fortitude and endurance. Therefore, this paper is directed more as an appeal on behalf of the equipment department for a more sympathetic understanding and reciprocal co-operation in the world's greatest sporting event, "Railroad Operation" where, as in any sport, a timely good word or a friendly criticism pays dividends and the reverse treatment piles up deficits.

The subject of railway equipment problems is as extensive as the universe for, wherever railroads have extended, these problems have pursued and they differ probably more in extent than in diversity. All such problems can be divided into three main subjects; namely, engineering, operation and maintenance. Each of these subjects will be briefly reviewed in the order named, which is the order of logic if not of importance.

There are few railroads today which maintain a sufficiently large equipment engineering department to entirely handle its equipment designs. They are, therefore, dependent partly, if not largely, upon builders and manufacturers for a portion of this work. It becomes, or should become, a joint responsibility of the railroads, the builders, and the manufacturers and, no doubt, fortunately so, since the experience of the builder in contact with a large number of railroads, the experience of the manufacturer as a specialist, combined with the knowledge of the railroad as to its individual needs, must of necessity produce a more satisfactory product than either alone. It is most essential, however, that a sufficiently large engineering department be maintained to study, analyze and correctly deduce the requirements, prepare preliminary plans, basic specifications, and follow the design through to completion with builder and manufacturer.

Importance of Engineering Studies

Digressing momentarily, the statement is ventured that the importance of engineering studies and the development of engineering plans is little appreciated. It is not often thought of as involving in most cases a protracted analysis, a multitude of scientific calculations, and the accurate preparation of a vast number of drawings. There is a tendency at times on the part of those who do not appreciate what is involved, to criticise the apparent delay in the preparation of plans, and a further tendency to over-ride a carefully studied and prepared plan for some preconceived personal opinion.

A number of years ago the speaker was asked for an explanation of the delay in delivery of some passenger equipment. There was only one answer, the time required in the preparation of plans due to a new design. The reply elicited this statement; "Our business is hauling passengers, and we cannot haul them with blue prints"; to which this answer was made: "True, but unfortunately neither can we haul them properly without blue prints." Structures do not happen, they are erected in accordance with a pre-arranged plan which should certainly be a carefully and logically prepared one.

If there is anything to which the speaker has devoted his time in the past few years, it is to the elevation of equipment engineering to its proper plane and to create a greater and broader understanding of its functions. It there is anything which should arouse the ire of the engineer, it is a summary demand for the immediate redesign of existing or the immediate preparation of new plans. And yet, care must be exercised to see that studies are not too long delayed or plans too long postponed, since progress is essential and procedure without completed plans is speculation of the worst sort.

The chief function of an engineering department is the development of truth; beyond that, engineering is largely a matter of common sense and judgment, for, given the facts, a decision is usually a simple matter. The chief obstacles in the development of truth are personal prejudice, commercialism, and the abstruse nature of some of the problems presented.

Personal prejudice is not a fault of any individual or group of individuals, but more of a human trait. It is only natural for each to father his own child, but it is necessary for someone to develop whether the child is of the proper sex, age and constitution for the particular function involved, and the first attribute of the true engineer is a mind open to conviction when confronted with conclusive facts. Yet, there are so-called engineers who use their engineering knowledge in an attempt to derive a preconceived answer rather than approach the problem in a broad-minded desire to find the correct answer. Attention is again called to the fact that the engineer's task is an exceedingly difficult, sometimes an impossible one, when confronted entirely by personal prejudice.

Commercialism Versus Good Engineering

Considered solely from an engineering standpoint, commercialism is only an evil; considered from almost any other standpoint, it is an essential evil, because it frequently becomes necessary to sacrifice good engineering for commercialism; essential because financially successful industries are essential to the progress of the universe.

The speaker once attended college under the tutelage of a professor who, it is believed, was without a superior as an engineer. He was at one time chief engineer of a large corporation. He resigned his position and accepted a professorship at an inadequate salary because of the necessity of frequently sacrificing good engineering for commercialism, nor would he alter his decision when the company offered to double his salary.

The above case represents one extreme. The other is the company or individual who, for personal gain,

* Abstract of an address at the September 17, 1926, meeting of the New York Railroad Club.

attempts to make abnormal profits because of being in position to take such an advantage. It is usually the case that such a compainy is not careful of the quality of its product. It is either ignorant of or indifferent to the fact that customers come by necessity and not by desire and that such policy will sooner or later "come home to roost."

The best combatant against such conditions is an efficient, sane purchasing department, for which we should be most thankful. One of the best known methods of avoiding excess expenditures is a thorough co-operation between the purchasing and engineering departments. Assuming completed plans and specifications, the remaining problems are the selection of proper materials, accurate fabrication, and careful erection.

A department organized for the purpose of materials study and capable of producing sane specifications and careful inspection, is of incalculable value in connection with not only the correct design but with the proper functioning of equipment in service, the cost of maintenance, and with its term of service. Its function is of extreme importance and it should be composed largely of thoroughly trained analytical engineers.

In dwelling on these engineering department problems, attention is called to the fact that such difficulties as have been cited are not so peculiar to engineering perhaps, but are more or less universal. What physical problems exist will be referred to subsequently.

Operation of Railway Equipment Presents Many Problems

The operation of equipment presents problems which are many and varied and which are the subject of constant study, thought and experiment. All of these problems are centered about the main object of obtaining maximum utilization from all equipment. It is highly probable that greater utilization is obtained from passenger cars than from any other piece of equipment. This is due to the very nature of its function; for the identical reason that the least percentage of utilization occurs with freight cars which far too often must make partly loaded or empty mileage and far too often must serve as storage warehouses. Available statistics show that vast strides have been made in the past several years in speeding the movement of freight cars. This has been done by accelerating yard operations, more classifying to or near destination and more efficient handling of L.C.L. freight through transfers, together with the actual faster operation of trains enroute.

The thought has been expressed that with the relatively low efficiency in freight car movement, cheaper cars should be purchased to reduce the investment and thus increase the relative return. It is true that the character of freight car equipment built today is expensive but, likewise, it is not so troublesome or expensive from a maintenance standpoint, permitting more serviceability and less time on repair tracks and thus tending to reduce the number of units necessary for a given work. One of the very grave problems, therefore, is the determination of the extent to which refinements and betterments should be introduced into freight car design, requiring the most careful analysis of plans and specifications and the observance of the effect on operation.

Retirement of Old and Purchase of New Equipment

It is quite probable that the freight car equipment of the entire country is in better general condition today than at any previous time. This is partly the result of the liberal retirement of inadequate and the purchase of new equipment, and partly the result of thorough and systematic repairs. There is still much to be done along this line as and when the railroads can afford it, but it would sometimes appear that there is too much tendency to patch up and perpetuate an obsolete, inadequate and uneconomical unit of equipment rather than to retire it and purchase new equipment to derive the benefit of the advanced state of the art in building. The determination as to when it becomes economical to retire old and purchase new equipment is a problem of far-reaching importance and most worthy of careful thought.

In the operation of locomotives, the big problem is also maximum utilization; which is keeping the locomotive in service and hauling maximum load. Much has also been acomplished in the past few years in this field. Carefully prepared systems of loading trains, longer locomotive runs, closer supervision, better maintenance, and better design have all contributed. That idle equipment is a total loss of investment, should ever be borne in mind.

There are two factors which have an important bearing on this question which are too often ignored, or, at least, neglected. First is the segregation of power by classes. Much effort is wasted in maintenance and in yard and road operation in the attempt to operate a division with a number of different classes. It is admitted that 100 per cent segregation is impossible in most cases, but it is also impossible to conceive of a situation where no segregation is possible, and to whatever extent it is effected, to that extent will benefits accrue.

The other factor is the number of locomotives in actual service in relation to a given demand. It is too frequently the tendency to take locomotives out of storage at the first indication of increased traffic or severe weather and, as strange as it may appear, an actual shortage of power is sometimes created in this manner because of congestion at terminals created by the excess. When it is necessary to hold a locomotive outside for hours awaiting its turn in the enginehouse, it is evident that there is an excess of power. The fewer locomotives actually in service, the better for all concerned and the more economical the operation.

Enginehouse Foreman Has Large Responsibilities

It would be possible to discuss maintenance problems for hours, and without effort, for they are as myriad almost as the stars, but it was the speaker's intent to confine the discussion more to basic principles rather than physical enumeration of details. Yet the subject strikes a most sympathetic chord in our being. If there is anyone who is in need of every sympathy, every help and every possible encouragement, it is the individual carrying the responsibility of equipment maintenance, and most particularly the engine-house foreman. One of the greatest mysteries of the ages is the reason for systematically and universally assuming that he is at the bottom of all evil, the cause of all delays. When the speaker held such a position he finally came to the conclusion that the foreman was universally suspected of deliberately delaying dispatchments, and manufacturing engine failures. A good engine-house foreman is worth his weight in gold, and he should receive a crown in heaven, for there is rarely one available for him on earth.

Speaking of engine failures, the nightmare of the motive power department, the thorn in the flesh of the passenger, the fly in the ointment of economical operation. A genius who could devise a patent that would eliminate them or a senator who could pass a law prohibiting them, would earn the right to undying fame.

Seriously speaking, the assertion is ventured that engine failures or equipment failures will never be

eliminated, but the further assertion is made that they can certainly be kept to a respectable minimum. After all, the bulk of such failures are the result of careless inspection, careless repairs, poor judgment, and failure of material. In other words, it can be stated that the chief cause lies in the frailties of human nature. A carefully laid plan of periodic inspection of what might be termed vital parts, with close supervision, will go a long way toward remedy. A close co-operation between the equipment and the engineering departments should be of material benefit.

The speaker has made a conscientious effort to extend relief in insisting on ruggedness in design and the elimination of all bolts and nuts possible. A determined effort is being made to extend knowledge of the effects of material working and machining on the strength of structure, and it is pointed out that a man who has not had the opportunity to learn the effect of improper working or machining cannot be blamed or held liable for the consequences of his act.

Proper Maintenance Demands Adequate Facilities

Proper maintenance of equipment demands adequate facilities, adequate forces and adequate supervision. Last, but by no means least, it demands proper design. There are many parts of equipment, particularly locomotive equipment, which, if they might be so constructed as to run from shopping to shopping with general freedom from maintenance difficulties, would eliminate one of the greatest problems of present day operation. That roller bearings may become a commercial possibility in the railroad field, sheds a ray of hope on some of those problems.

Designers and inventors can justifiably devote a great amount of time to the solution of some of these problems. In so doing the suggestion is advanced that the usual plan be reversed, at least to some extent. It is felt that in the introduction of the large number of economy devices which have appeared in recent years, the design was based largely on the economy of operation and too little on the economy of maintenance, and that the latter should be given its full proportion of value.

There is another problem which in many locations is a very serious one from a boiler maintenance standpoint; that is, the character of the water. The speaker recently had the pleasure of reviewing a complete report of an exhaustive study of a railway water supply—the first, it is believed, ever produced in complete form. It involved the study of over 600 water stations, and it carried the recommendations as to means by which quality of water for boiler purposes could be improved.

The American Railway Engineering Association has had a committee working on this problem for a number of years. They have developed a formula by means of which an approximation can be made of the loss from an economy standpoint in the use of poor water. This formula applied against any district or any railroad reveals some startling figures. The report referred to indicates that this problem may also be solved or a least considerably relieved.

A Miniature Railroad Train, propelled by electric motors and started and stopped by spoken words, conveyed by means of radio apparatus, was one of the features at an exhibition held in London, England, last week. The maker of the contrivance, Major Raymond Phillips, started the train by shouting "Go" and stopped it by shouting "Stop." The voice waves were spoken into a microphone so adjusted that a certain pitch caused the operation of a relay on the locomotive.

I. C. C. Again Urges Competitive Bids

Washington, D. C.

THE Interstate Commerce Commission, Division 4, has found a new way for bringing pressure to bear upon railroads to offer their equipment trust issues for sale through competitive bidding. In two decisions issued this week it has offered the Chicago, St. Paul, Minneapolis & Omaha and the Illinois Central the alternative of offering such securities for sale through competitive bidding to the highest bidder, but at not less than the price they had arranged with Kuhn, Loeb & Co., or of selling them without competitive bids at a price higher than that arranged with Kuhn, Loeb & Co.

In both cases the report by Division 4, Commissioners Meyer, Eastman and Woodlock, refers to the results obtained recently by the Western Maryland, which marketed an issue of equipment trust certificates through competitive bidding at a price to make the average annual cost to the company approximately 4.578 per cent. These were 4½ per cent certificates, bearing the same rate of dividends and maturing in the same number of instalments as those covered by the Illinois Central application. They were sold at 99.517 and the commission fixes this as the minimum price in the Illinois Central case in the event they are sold without competitive bids. The Illinois Central had arranged, subject to the commission's approval, to sell the certificates to Kuhn, Loeb & Co., at 98.43, upon which basis the average annual cost would be approximately 4.75 per cent. If the securities are sold competitively the commission's order fixes 98.43 and accrued dividends as the minimum price.

In the case of the Omaha equipment trust, Kuhn, Loeb & Co., had offered to buy the $410,000 of 4¾ per cent certificates at par and accrued interest, which would make the average annual cost 4.75 per cent. The commission authorizes their sale without competitive bids at not less than 100.803, or on a 4.578 per cent basis, or through competitive bidding at not less than par.

The Illinois Central report says: "The applicant states that after due consideration it has reached the conclusion that the present policy of marketing its securities should not be abandoned and that it is for the applicant's best interest to sell them to its regular bankers. It believes the price offered is fair and advantageous to it and is as high as could be reasonably expected from a responsible purchaser and on a basis which will permit the distribution of the securities to permanent investors at a fair price. We are not convinced that the method proposed by the applicant for marketing its securities is in the best interest of either the applicant or the public. Our views as to the advantages of competitive bidding as a method of marketing such certificates are set forth in our report in Western Maryland Equipment Trust, 111 I.C.C. 434, decided June 23, 1926." In that report the commission expressed the opinion that railways may now profitably adopt the policy of resorting to public competitive bidding for the sale of equipment certificates.

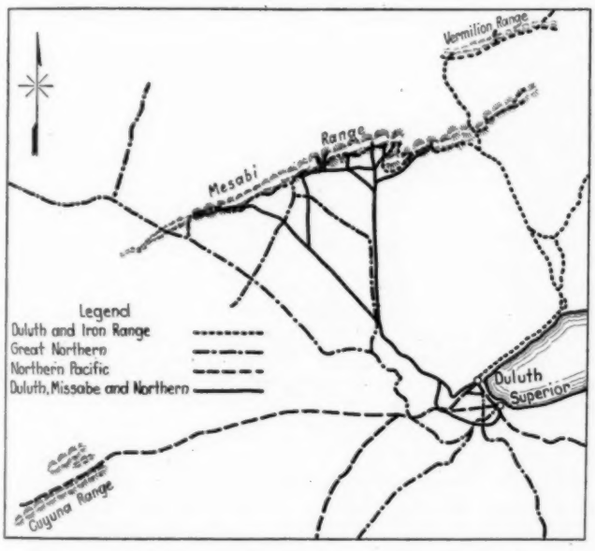
In the Omaha case the report says: "The applicant states that because of the small amount of the issue and the importance of prompt action it is not feasible to invite bids for the sale of the certificates," but that, should it be possible through competitive bidding to dispose of the proposed certificates on the basis of the Western Maryland issue, "the saving to the applicant, notwithstanding the small amount of the issue, would be considerable. The record fails to show such urgency for prompt action as to render the inviting of bids for the sale of the certificates infeasible."

Handling the Nation's Largest Concentrated Traffic*

A description of the methods developed to handle 50,000,000 *tons of iron ore in six months*

By W. H. Hoyt
Chief Engineer, Duluth, Missabe & Northern, Duluth, Minn.

THERE are three distinct producing iron ranges in Minnesota, the Vermilion, Mesabi, and Cuyuna. In trend the Vermilion and Mesabi are approximately parallel and about 15 to 20 miles apart. The Vermilion lies farthest north, near the Canadian boundary. It is from 75 to 80 miles due north of Duluth. The length of its productive part is about 20 miles. The Mesabi range is from 50 to 75 miles north and northwest of Duluth. Its length is about 110 miles and the length of its present productive area is about 80 miles. The Mesabi range is the largest producer and contains the largest ore reserves of the three. The Cuyuna range



How the Railroads Serve the Minnesota Ranges

lies nearly 90 miles southwest of Duluth, and is the last of the Lake Superior iron ranges to be developed. It is next second in quantity of proven ore.

The most of the ore from the Cuyuna and the Mesabi ranges is shipped from the Duluth-Superior harbor while the Vermilion range ore is shipped from Two Harbors, a port on the north shore of Lake Superior about 25 miles from Duluth. The Mesabi range shipped 35,530,956 tons of ore in 1925, or about 65 per cent of the total shipped from the Lake Superior district, which includes the mines in Wisconsin and Michigan also.

There are four phases of the transportation of iron ore, as follows: by railroad from mine to local steel and pig iron plants, by railroad from mines to lake ports, by boats from upper lake ports to lower lake ports, and by railroad from lower lake ports to the steel furnaces. The largest part of the ore is sent to lower lake ports because the steel plants have been located near the centers of greatest consumption and near supplies of coal and limestone. All-rail shipments to such points as St. Louis have not developed into large amounts because of higher freight rates. St. Louis will take about 150,000 tons from the Cuyuna range in 1926 at the rate of $2.93 a ton.

Railroad cars are loaded at the mines by four methods, as follows: direct from the ore beds by means of steam or electric shovels; from stockpiles accumulated during winter operation of underground mines, by means of steam shovels; from shaft head frames of underground mines operated during the summer time; and from bins at beneficiating or ore treatment plants, using ore from either open pit or undergound mines. In 1925 about 28.6 per cent of the ores shipped in the Lake Superior district were treated or beneficiated, whereas in 1924 only about 11.9 per cent of the ores shipped were treated. From the railroad viewpoint the increase in beneficiated ores is proving an advantage by affording better loading of ore cars with less damage to the cars.

The volume per long ton for iron ores of these ranges varies from 7 cu. ft. for hard specularite and magnetite ores to about 17 cu. ft. for the soft or porous hematite and limonite ores. The volume depends on the density of the components, on the degree of breakage into small pieces and on the percentage of iron and moisture. This wide variation of weight must be taken into consideration when making up the tonnage and number of cars of each ore train. The ore shipped from the Mesabi range in 1925 averaged in percentages on analysis 52.05 iron, 0.061 phosphorus, 7.99 silicon, 0.68 manganese, and 11.14 moisture.

The ore cars loaded at the mines are either set into the yards of the railroad by the engines of the mining company or are allowed to coast by gravity into the railroad yards. Here trains of 125 cars on the Duluth, Missabe & Northern, or 160 cars on the Great Northern are assembled for road haul to the weighing and classification yards at Proctor, Minn., or Allouez, Wis. Two of the Duluth, Missabe & Northern trains and sometimes one of the great Northern trains will fill a boat.

Ore cars were originally of wood and as small in capacity as ten tons. Wood construction was employed for cars up to 25 and 30 tons. Steel cars were developed to carry 50 tons and these came into general use by all ore-hauling roads. The Great Northern experimented with 75-ton cars and now has 2,750 of these cars in service. The Soo has ordered 200 cars of 75 tons capacity. The Duluth, Missabe & Northern is now testing 50 cars of 75 tons capacity. These larger cars increase the capacity of the track systems and effect economies in switching operations.

The Great Northern is using heavy Mallet type en-

* Abstracted from a paper presented at the International Mid-Continent Architectural and Engineering Convention at Duluth on August 12.

gines on long drags of cars on easy grades at slow speeds. The Duluth, Missabe & Northern is using Santa Fe type engines on lighter trains on 0.3 per cent adverse grades at speeds of 30 to 35 miles per hour. The Duluth, Missabe & Northern also uses Mallet type engines on hill grades of 2 per cent for the return of empty cars. All ore trains are operated by air brakes of large capacities and improved design.

The Duluth, Missabe & Northern has a double track system from Duluth to Hibbing and Virginia via the old main line and another double track to the Hibbing mines by the Alborn and Hull Rust short line branches. The remainder of the Alborn branch and the Biwabik branch are single track. There are several short branches of single track. A large part is rock ballasted and track laid with 100-lb. rails.

The Great Northern has a double track from Allouez, Wis., to Swan River in Itasca County, the balance of its ore lines being single track. One hundred pound-rail is used on tangents and some 130-lb. rail on curves.

The heavy engines and long trains of heavy ore cars have required the use of heavy modern steel and concrete bridges of E55 and E60 rating on both railroads. Many heavy fills and concrete culverts have replaced wooden bridges.

At points of junctions of main lines and crossings of one railroad with another, the State of Minnesota has required the installation of approved interlockers. These combine the manual or mechanical system with electric distant signals and are in general in a high state of efficiency. No other signal systems except station semaphores and short stretches of block signals where joint operation is in practice are in use on the ore railroads.

Dispatching is done by telegraph on the Duluth, Missabe & Northern, by telegraph and telephone on the Great Northern and by telephone on the Duluth and Iron Range. On the Duluth, Missabe & Northern ore trains operate on the extended yard principle, each train protecting itself against all other extras and taking siding for scheduled passenger and local freight trains.

If the ore season continues into November and the weather turns cold, the ore freezes in the cars and must be thawed before it can be emptied into the ore dock pockets and into the boats. This is done by passing steam into the ore in the ore cars a sufficient length of time to heat the whole mass thoroughly.

The ore cars are hauled to the ore docks by Mallet engines. Here the various tracks, switches and movements of trains are operated by means of telephone stations and switch tenders.

Dock engines under the direction of a dock foreman switch the cars to numbered pockets arranged for handling a group ore. Here the ore is stored until the proper mixtures can be built up. The larger pockets will hold 300 to 400 tons of ore in a twelve-foot length of one-half of the dock. Some of these docks have 384 pockets and can store 115,000 to 154,000 tons of ore, enough to fill 10 to 13 large boats. Four lines of tracks on top may be filled with cars and the docks are long enough to load six boats at once at each dock. Ore is loaded into the boats by gravity as the decks are from 72 ft. to 84 ft. above the water level.

In common with the early design of wooden ore cars, ore docks were also built of wood, mostly Douglas fir brought from the Pacific Coast. As much as 12 million board feet were used in the construction of a single dock. These wooden docks had a life of about 20 to 22 years with some replacements of defective timber. With the development of the ore mines, giving stability to the business, steel and concrete have been used for the construction of the newer docks. Six wooden docks were dismantled between 1916 and 1925 and there now remain only three wooden docks in the Duluth-Superior harbor. With the change from wood to steel and concrete there came an increase in the size and betterment of spout hoists and the lighting of facilities, resulting in better dispatch of boats. During the early part of 1925 one of the larger iron ore loading dock systems of Lake Superior loaded 734 boats up to July 1 with an average cargo per boat of 8,150 tons in an average dispatch time per boat of 4 hours and 15 minutes. The Steamer D. G. Kerr was loaded at the Two Harbors dock with 12,817 tons of ore in 16½ min.

There are 357 bulk freighters on the Great Lakes with a combined capacity of 2,862,900 tons at a draft of 19 feet, the average of the whole fleet being 8,019 tons. This large fleet is divided into several large groups, each under one ownership. The largest company is the Pittsburgh Steamship Company with 96 vessels of a total capacity of 739,800 tons at 19 ft. draft. The next largest is the Pickands, Mather & Company with 45 boats, with a total capacity of 364,400 tons. The third largest fleet is Hutchinson & Company with 20 boats of 167,800 tons. The Cleveland Cliffs Iron Company has 23 boats of 164,500 tons capacity. The boats average 30 round trips in the ore season to points 700 to 1,000 miles from Duluth. The season mileage is from 40,000 to 50,000 miles, traveled at a speed of 12 to 13 miles per hour. During this active season the crews have no time off except in the daily routine of ship duty and a little shore leave during the unloading of the boats. Round trips are made in seven days.

Ore and grain are carried eastbound and coal and limestone westbound. As the ore and grain tonnages exceed the coal and limestone, many of the boats return westbound with water ballast only. The volume or tonnage of cargo is governed by the depth of water ballast only. The volume or tonnage of cargo is governed by the depth of water over the sills of the locks at the Sault Ste. Marie river. As these are of fixed height, the height of the water on Lake Superior governs this depth. Because of the lower lake levels the draft has been reduced to 18 ft. 3 in. This reduced draft has reduced the trip capacity of these boats and correspondingly the revenue derived from the business. There is a loss per boat per season of 90,000 tons capacity as a result of lower levels than in 1920.

These boats receive about 3½ cents a bushel for carrying grain to lower lake ports, about 70 cents a ton for ore from Duluth-Superior harbor to Lake Erie ports, and about 40 cents a ton for coal from Cleveland to Upper Lake ports. Unloading ore at lower ports adds another 13 cents to costs.

Big Four Crossing Over Dixie Highway North of Middletown, Ohio

Southern Pacific Softens Water by Zeolite Method*

An explanation of the process and a discussion of its application in the railway field

By C. W. Sturdevant
Assistant Engineer of Tests, Southern Pacific

DURING the past 12 to 15 years, considerable attention has been paid to the zeolite method of water softening, but practically no railroads with the exception of the Southern Pacific, have made use of this treatment in connection with locomotive boilers. The principle of zeolite treatment is that of base exchange, by means of certain silicates possessing properties by which they may combine with either sodium, calcium or magnesium.

When ready to soften water, the mineral is possessed with a supply of sodium in exchangeable form. During the softening run, this base sodium is replaced by the calcium and magnesium of the hard water. When the supply of the sodium is exhausted, that is, when the mineral has become possessed of its capacity of the calcium and magnesium, the action ceases. At this stage the mineral is ready for regeneration, during which it is treated with a solution of sodium chloride (common salt), which is cheap and readily obtainable. During the regeneration, the exchange is exactly the reverse of that which takes place, while softening water. At this time the sodium of the salt is taken up by the mineral which gives up its content of the calcium and magnesium in exchange therefore. The hardening compounds combine with the chloride of the salt solution which, during the regeneration, or brine flushing, is changed from sodium chloride to calcium chloride or magnesium chloride. These chlorides, being soluble, cause no sludge and are therefore flushed off through any convenient drain. With the rapidly acting mineral now used by most of the manufacturers of zeolite water softeners, the time required for reconditioning of the zeolite mineral has been reduced to 15 or 20 min. The two processes, softening water and then regenerating with salt brine, are repeated alternately with practically no loss of the mineral itself, during years of service.

Advantages of Zeolite Over Other Systems

In the chemical dosage system of softening the desired results are only possible when an excess of the chemicals is put into the water to drive the reactions to completion. This excess of chemical remains in the treated water. The zeolite exchange method requires an excess of salt solution, but this treatment is entirely independent of the actual water softening, which does not take place while regeneration is going on, hence what excess of salt solution is required is simply washed away with the chloride of calcium and magnesium and does not reach the treated or soft water. During the exchange process the exchange of the sodium in the system for calcium and magnesium of the untreated water is in the exact relation of the combining powers of these elements. Therefore, over-treatment is impossible.

*Paper presented before the Western Society of Engineers at Chicago, on October 4, 1926.

At the present time the Southern Pacific has in operation nine plants of the zeolite or base exchange type of water softeners and five more under construction. The plants thus far installed and under construction, are of the Wayne and Permutit manufacture and with the exception of one are of the down-flow type. All of the plants used by the Southern Pacific make use of the natural (zeolite) sand found in New Jersey, which is cleaned, graded and stabilized preparatory to use.

The only cost attached to this form of water treatment, other than the interest and depreciation on the investment, and the little attention necessary, is the salt required for regenerating the mineral. The salt required is directly proportional to the incrusting content of the water treated and is almost exactly ½ lb. of salt per grain of hardness per gallon, for each 1,000 gal. treated. As an example, a water containing 14 grains of incrusting solids per gallon requires 7 lb. of salt per 1,000 gal. of water treated.

The amount of zeolite required is also proportional to the amount of water it is desired to treat between reconditioning periods as the converting power of the natural zeolite is approximately 40 grains per pound of mineral under the most favorable conditions or 30 grains under ordinary operating conditions, consequently the size of the plant must be adapted to the variable local conditions.

Character of Waters Treated

The waters which are being treated on the Southern Pacific's lines are, by analyses, similar to those found elsewhere. At the present time, the process is being applied to waters carrying from 11 grains of incrusting matter and 5.48 grains of soluble matter per gallon up to 33.94 grains of incrustants and 8.69 grains of soluble matter per gallon. At El Centro, Calif., the water is taken from the Colorado river and carries 26.7 grains of incrustants and 20.58 grains of soluble salts.

In all cases the total incrusting matter is converted to soluble matter through the zeolite method of treatment, producing a water of zero hardness, with the exception of the silica, alumina and oxide of iron, which in ordinary cases amounts to from ½ grain to 3 grains per gallon. This, however, does no harm nor does it form scale in the absence of a binder, such as the calcium and magnesium carbonate and sulphate, which as stated, have been converted to sodium carbonate and sulphate.

The soluble matter produced by the treatment and added to the soluble matter originally contained in the untreated water, creates what is ordinarily termed light water and which has always been feared due to the belief that much foaming and priming might result, that corrosion or pitting would follow, or that embrittlement of the boiler steel might be encountered. It is true that in some cases, where the locomotive boilers are badly sealed up, foaming has caused trouble immediately after start-

ing a zeolite plant. This is due to the fact that the salt water has a dissolving effect upon the old scale, producing a heavy sludge within the boiler. If this is not blown out regularly and often, foaming will result. However, with reasonable care in handling the blow-off cock, together with proper washing of the boiler, little, if any, trouble is encountered, and after a reasonably short time, most of the old scale will have disappeared and this trouble from light water disappears.

In many places where we have started these zeolite plants, we have experienced no trouble. For example, the stations at Calexico and El Centro, in the Imperial Valley of California, are in a very bad water district. No light water conditions were experienced and, notwithstanding the heavy traffic at the time of starting the plants, no anti-foaming compound was necessary.

Studies of Corrosion Were Made

Particular attention has been given to corrosion and pitting. Pieces of new boiler plate, boiler tubes, steel wire, etc., have been suspended in the boilers, as close to the fire sheet as possible and they have been left in this position from six months to a year, only to find the material in its original condition. We appreciate that such tests are not as severe as where the metal is a part of the fire sheet or tube but thus far we have seen nothing to sustain fear of corrosion or pitting. While we do not attempt to contradict the caustic embrittlement theory, our experience has disclosed nothing to support it.

It is not my intention to claim that the zeolite treatment is a cure-all for all waters. There is no doubt in my mind but that in a water excessively high in temporary hardness, calcium and magnesium carbonate, this hardness should first be reduced or precipitated by means of the lime treatment before passing the water through the zeolite plant, thus reducing the total soluble or alkali content after treatment to a minimum. However, the Southern Pacific has not, as yet, had to resort to this pretreatment, due to the fact that we are not attempting to treat water excessively high in temporary hardness by the zeolite method at this time.

By way of illustration of what happens when water is treated by the zeolite method, the following table shows the comparative analyses before and after treatment of waters at Los Angeles, Cal., and Oakland, which were treated by the zeolite process for a considerable time.

	Los Angeles city water untreated	Los Angeles city water zeolite treated	Oakland city water untreated	Oakland city water zeolite treated
Calcium carbonate	8.51	None	7.46	None
Magnesium carbonate	2.16	None	2.57	None
Calcium sulphate	1.11	None	.41	None
Magnesium sulphate	1.57	None	2.45	None
Calcium chloride	None	None	None	None
Magnesium chloride	None	None	None	None
Silica and oxides of iron and aluminum	1.87	1.63	1.28	1.11
Incrusting solids	15.22	1.63	14.17	1.11
Alkali carbonates	None	11.31	None	11.37
Alkali sulphates	4.55	7.99	.23	3.44
Alkali chlorides	2.33	2.04	5.19	5.19
Alkali nitrates	.58	None	None	None
Non-incrusting solids	7.46	21.34	5.42	20.00
Total solids	22.68	22.97	19.59	21.11

The figures represent grains per U. S. gallon.

It will be noted that practically all of the incrusting matter has been converted to either sodium carbonate or sodium sulphate. In the case of the Los Angeles water which contains 15.22 grains of incrusting matter with only 7.46 grains of soluble matter, before treatment there are 1.63 grains of incrusting solids in the treated water, all of which are silica, etc., while there are 21.34 grains of soluble matter. However, the quantity of total solids is practically the same, nothing having been added to or taken away from the water.

It will also be noted that notwithstanding the fact that sodium chloride (common salt) has been used in the reconditioning of the zeolite mineral, none of this chloride is introduced into the treated water. The analyses, if absolutely correct, should show exactly the same amount of sodium chloride after treatment as before. This is shown by the Oakland analysis.

In conclusion, actual observations made thus far show a marked reduction in the maintenance cost of boilers operated in zeolite treated water districts, as well as savings due to a reduction in boiler washings which in turn makes possible a more continuous performance of the locomotive or boiler.

Railroads Favor Permissive Consolidation Bill

WASHINGTON, D. C.

ALFRED P. THOM, vice-chairman and general counsel of the Association of Railway Executives, discussed the subject of railroad consolidation legislation and other railroad questions with President Coolidge during a call at the White House on September 30. He left with the President, who is beginning to gather material for his message to Congress, a copy of the statement he made last Spring before the House committee on interstate and foreign commerce on the Parker consolidation bill, which provides for voluntary consolidations, subject to the approval of the Interstate Commerce Commission. This bill has been endorsed by the Interstate Commerce Commission, and, as Mr. Thom indicated in his testimony at the committee hearings, its principles are generally acceptable to most of the railroads, although the executives are not unanimous on the question.

The Parker bill, however, meets the views of most railway executives much more nearly than the principle of the Cummins bill, which was designed to bring pressure to bear upon the roads to consolidate into a limited number of systems. The Parker bill also carries out in a general way the views expressed by President Coolidge in his last two general messages to Congress urging amendment of the consolidation provisions of the present law. Mr. Thom also described to the President the satisfactory working out of the plan by which co-operation is obtained between the railroads and the shippers through the medium of the shippers' advisory boards and the way in which this has made it possible to deal with critical transportation situations which have arisen.

Mr. Thom in a statement to a newspaper which he said had misquoted him on the subjects, explained the position of the railroads, as follows:

"It is not true that the carriers of the country are solidly behind the so-called Parker bill for railroad consolidation," he said. "It is true that, if there is to be legislation on the subject, the railroads are in favor of a permissive, as contra-distinguished from a compulsory, system. The Parker bill is a permissive measure, whereas the Cummins bill contains what may be termed certain elements of compulsion. Accordingly, the permissive measure is preferred over the compulsory one."

Mr. Thom also called attention to the fact that in his statement before the House committee he said:

"I think it is fair to state to the committee that there is probably some difference of opinion among the railroad executives as to the desirability of consolidations. But my belief is that a great majority of the executives think that it is a wise policy, if made permissive."

Railroad Station, Helsingfors, Finland

Younger Men in World's Conference

Railroad delegate from the United States tells of his impressions and experiences at the great meeting in Finland

By Warren B. King

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(At the third annual meeting of the Younger Railroad Men's Conference, held at Pittsburgh about a year ago, some of the discussions covered questions which were scheduled for consideration at the Nineteenth World's Conference of the Y. M. C. A. to be held in Finland in August, 1926. Indeed, the findings on these questions at the Pittsburgh meeting were transmitted to those in charge of the program of the world conference. Stimulated by these discussions the group at Pittsburgh expressed a desire to be officially represented at the Helsingfors conference. As a result of a free-will offering on the part of the delegates, supplemented by generous aid from Dr. John P. Munn, chairman of the Transportation Committee of the National Council of the Y. M. C. A., it was found possible to arrange for such a delegate, and President King of the Younger Railroad Men's Conference was unanimously elected as its representative. The Great Northern Railway cordially cooperated by making it possible for Mr. King to take the time required for the trip abroad. He will make his official report at the Fourth Annual Younger Railroad Men's Conference, which is to be held at Omaha, Neb., November 19, 20 and 21. Meanwhile he has courteously acceded to our request for a brief account of the Helsingfors Conference and his general impressions.—Editor)

YOU would have been impressed, I am sure, if you could have been with me at Helsingfors, Finland, in early August and have watched the delegates to the Nineteenth World's Conference of the Young Men's Christian Association arrive by air, by water, and by rail; to see the colorful display as representatives of the different countries in their native costumes strolled down the wide esplanade—Indians with their turbans, Egyptians with their red fezzes. Chinese with their flowing silk gowns, and Scots with their characteristic kilts, a combination unique indeed.

The sight was so unusual to the Finlander that he spent hours in front of our meeting place each evening, wondering, gazing, and marveling at this sight of peoples of other countries as they assembled for an experience in fellowship and understanding. Such an experience was the essence of the Conference. We learned to listen. We came to apprehend and the more fully respect the other man's point of view. We acquired the practice of seeing (not always appreciating or necessarily agreeing with) another outlook, another angle of vision of truth, through the eyes of men of another race or nation or character of culture than our own.

Warren B. King

We walked and talked and lived with men and boys of every land. For us they opened windows through which we could freely look into the lives of all people from every continent and almost every nation in the world. Men of Africa and Asia and the ancient East, men of Europe and America were meeting together possessed of a desire to procure new ideas. They were ready to deal in fellowship.

We soon learned that many of our problems were their problems, but the methods employed in solving these problems were different. We heard startling things, disquieting things, uplifting things. The jealousies, the envies, and the hatreds among the nations were apparent. There was no attempt to dodge pertinent issues for the sake of friendliness. We were discussing the known points of friction existing in the experiences and minds of men and boys all over the world. Sex matters, international relationships, inter-racial and vocational problems, and problems of home life were irritating issues.

It was not a conference of methods. We did not attempt in a few days to solve the problems that have been vexing mankind for centuries. We did find, however, that it was possible for men and boys of many nations

to meet in a spirit of friendliness and tolerance; that it was possible to discuss burning issues without rancor.

It may seem that mankind is in a sorry state of affairs when one travels thousands of miles in order to make this apparently simple discovery. On the other hand, one has only to reflect for a moment on the many examples of the strong national spirit of all nations, of armed conflicts still threatening, and of the apparent inability of leading statesmen to agree on many important international issues of the present day, in order fully to realize how much it meant to find out that people could really get together with a determination to understand the other person's point of view.

Why was this discovery made at Helsingfors? Because all delegates had in common the faith and belief in a higher and spiritual power to aid them in solving their perplexing relations with their fellowmen; because they brought to the fellowship of the Conference a spirit of humility which, after all, is vitally essential to world peace.

Youth Represented

This conference differed from other world conferences of the Young Men's Christian Association. Youth was represented and had an opportunity to be heard. Two hundred and thirty boys from 26 nations exchanged ideas and fraternized together. Frankness was the obvious virtue in their discussions. Youth from all over the world was found to be critical, alert, inquiring, doubtful of many of the approved and accepted practices, and thinking fast and straight—leaping at conclusions, if you prefer.

The discussion method was used to find the common group mind. Each delegate had ample opportunity for self-expression. The 1500 delegates were divided into 50 international groups. It was in these groups that problems were discussed, not argued. It has been said that there never was an international gathering where individual points of view and corporate interests emerged so distinctly and yet without contradiction, as at Helsingfors. One would suppose that where the individual unit was stressed, a blending of these units would be impossible; that either individualism or collectivism must be emphasized. But it was proved that through the individual the common group mind was reached. The two are inextricably linked. The reason for pursuing this method of group discussion was the conviction that the individual delegate was the most important element of the Conference. Chief emphasis was laid on these group discussions and long speeches were avoided; it was a conference that really conferred.

At Helsingfors we had met the man, observed him and listened to his opinions. Afterwards we visited his home, saw his workshop, watched him at play among his own hills and vales, and in general lived for a short time in his environment, which played such a large part in forming his opinions. As one of a party of 40 Americans that left the picturesque capital of Finland and traveled southward through Esthonia, Latvia, Poland, Czechoslovakia, Austria, Switzerland, Germany, and France, I gained many impressions, some of which helped me to appreciate the problems that I had heard discussed just a few days previous at the Conference.

Visiting these people in their own cities and their own homes, we found them not so free to talk, not so tolerant regarding the pressing local problems between themselves and their neighbors as their delegates had been in discussing these same problems at Helsingfors. Their own delegates, however, proved that they could talk in a spirit of tolerance; and for this spirit to gain a foothold and to influence the thought and action of the people of these local communities would, in itself, surely justify the expense and importance of this World's Conference.

Our departure from Europe left us with a better understanding of the many controversial problems, with a deeper appreciation of the culture life, and with a higher respect for the ideals that have guided our forefathers for centuries. I feel now as though I have something in common with the people in the foreign lands I visited. They are not strangers, just individuals who have been reared in another environment.

Bankers Discuss Rail Mergers

THE contention that compulsory consolidations of railroads is un-American and harmful combined with the belief that the carriers ought to be merged in a manner that will assist in attracting capital to the industry were leading features brought out in a report presented at the meeting of the American Bankers Association at Los Angeles on October 4. The report was prepared by a special committee of the Commerce and Marine Commission which committee was composed of John G. Lonsdale, president, National Bank of Commerce, St. Louis; John McHugh, president, Chase National Bank, New York; Robert F. Maddox, chairman, Atlanta & Lowry National Bank, Atlanta; and Fred I. Kent, vice-president, Bankers Trust Company, New York.

The report asserts that the time had now come when the railroads must resume their expansion so as to keep in step with the other industries of the nation.

"Let us call it," the report says, "an era of justifiable consolidation of the railroads and the adaptation to our common carriers of America's effective principle of mass production; or more correctly, transportation in evolution toward massed distribution to care for the tremendous production developed by the unified industrial growth of this still young nation."

Speaking particularly of consolidations the report says:

"Any one-sided relationship, or the unwise assumption by the strong roads of the burdens of the weak, only leads to the breakdowns of credit in which the public must eventually foot the bill. In this connection it is estimated that there are some 60,000 to 70,000 miles of railroad in the United States that cannot make a living. How much of this would enter into the unification plan is at the discretion of the Interstate Commerce Commission. However, it is not hard to realize the natural reluctancy of profitable railroads to tie up with unprofitable lines. Apply the same theory to any other business enterprise and the application hits close to home. Besides, the time when the abandonment of the truly unprofitable mileage of this country would be a community calamity has passed with the coming of the motor truck and it is just as unwise and unsound for losing railroads to be maintained by the public as for any form of business to be publicly subsidized.

"Yet, this committee is deeply mindful of the fact that consolidation must be done in a way to be beneficial, at least not detrimental, to the communities served by the railroads, and if, in the process of voluntary consolidation, important units are not included, then provision must be made to care for the worthy ones.

"But it is wrong alike with railroads, banks, grocery stores or shoe shops, or any business, to saddle a strong

unit with an undeniably weak one. If it is fully established that the road is a weak property, one of two things must eventually happen: If not able to earn operating expenses and taxes it should be placed in the 'observation ward,' with the view that it might be necessary to have it abandoned; or, if not able to earn something over expenses, its capital obligation should be reasonably adjusted to its earning capacity.

"This latter course is especially adaptable where unification of the strong with the weak seems imperative to prevent hardships to dependent communities. It would be unwise for such consolidations, undertaken to avoid abandonment, to be effected on a basis of making good the improvident or unfortunate investments in the weaker road.

"The really profitable and logical small lines have a natural protection in a consolidation program, in that many of these short lines, with limited physical value, show substantial net incomes by reason of a profitable division of the through rate. Present law forbids duplication of facilities, so that, in the event of unification, the owners of the small lines are likely to receive favorable attention based on their income.

"Desirable groupings of this sort would adjust the inequalities of earning among carriers, simplifying immeasurably the now vexing problem of short line financing. For, while under the transportation act, these dependents can borrow from the government surplus fund, the requirements are such that they could as well and as easily get the money from their bankers.

The Financial Significance of Consolidation

"The question of financial significance of consolidation is one that naturally received much attention from this committee. Frankly, we have encountered from the public no general opposition to, or demand for, consolidation.

"In its present form it is properly a matter of moment to rail executives, stockholders, forward-looking business men, economists, statesmen and financiers. The shippers are not voicing their concern, if they have any, for the practical ones can see no immediate rate amelioration, and rail service is admittedly of such standard now as to cause them little anxiety.

"But this deducation of supreme importance is patent; a more complete transportation system is necessary for the prosperity that is to be, and to this end capital must be attracted to railroad investment.

"One economist has pointed out that in 1923 there were 14,400,000 corporate stockholders in the United States, as compared with 4,400,000 in 1900. But this increased public ownership did not go into the vital industry of railroading, for the holders of such stock ten years ago were 500,000, as compared with 800,000 class I road security holders today. A pitiful increase by comparison to other utilities.

"It seems essential that the greatly improved credit of the railroad at present, so largely the result of efficient and economical operation, should not be impaired, but still further strengthened by the financial methods to be employed in effecting consolidations. In general we believe that the government, exercising such minute control of our common carriers, cannot escape, though no such tendency is noted, the responsibility of affording to the owners of rail property the legitimate expectation of every commercial proposition, a fair return on its value; and if the moderate return of 5.75 permitted but not guaranteed, which few roads have reached, is wholly inadequate to attract capital to the enterprise of transportation, adjustments should be made on the average of five-year instead of one-year periods. This, with the patent influence of consolidation differing the earnings in such a way as to make a more even distribution of the revenue paid by the public for transportation, should restore much of the attractiveness of rail securities.

"Railroad executives and the Interstate Commerce Commission may be relied upon to protect the growing confidence of the investing public by not increasing the ratio debt to equity by sanctioning any unwise combination of ill-assorted elements.

"All proposed natural consolidations so far have clearly and properly laid out the terms and financial arrangements upon which the consolidation was to be effected.

"Our conclusions against any form of compulsory consolidation can be easily substantiated. No one is more conscious than the railroads themselves that they owe their corporate existence as public utilities to the service rendered the public.

"Congress and legislatures admittedly have certain lawful control over them, but only so far and to such a degree as they do not destroy or lessen the value of such individual properties. In other words, they should not have the right to regulate these public utilities to the degree that they confiscate the property, either in whole or in part. If such a condition can be forced upon railroads, then no other properties are exempt.

"Inasmuch, therefore, as the Interstate Commerce Commission, after years of effort, has announced its inability to formulate a general plan of compulsory consolidation, and the entire scheme of forcing business men to do something with their own capital that may be against their own best judgment has been accepted as un-American, the repeal of this portion of the transportation act seems a popular and desirable course.

"New enabling legislation is essential to correct and supply a substitute for the demonstrated defects and shortcomings of the consolidation provisions of the transportation act of 1920. Another oversight is the failure to provide adequate machinery, and to confer clearly corporate power upon the railroad corporations to carry out an authorized consolidation, or to carry on after effecting such consolidation. The charters of few railroad companies confer the necessary corporate power to consolidate."

W. J. Harahan Points to Railway Safety Record

W. J. HARAHAN, president of the Chesapeake & Ohio and chairman of the general committee on automatic train control of the Association of Railway Executives, has made public a letter which he has addressed to the editor of the North American Review in reply to an anonymous article entitled "Murder on the Rails," which appeared in the Fall issue of that magazine, charging the railroads and the Interstate Commerce Commission with undue delay in connection with the installation of automatic train control.

"The glaring inaccuracies and misinformation in this article to which the author has been unwilling to sign his name," said Mr. Harahan, "make it necessary to set before you the facts with reference to the subject. The railroad managements have no responsibility which is greater and no purpose which is more definite and pronounced than to protect the safety of the traveling public, and when an adequate workable and dependable system of automatic train control has been devised, the

carriers will not hesitate to put it into use, particularly on those lines where difficult operating conditions render it advisable to make such installations.

"Due to the many safety measures which the railroads have installed, a passenger is more than four times as safe aboard a train today as 26 years ago. In fact, he is safer traveling in a train going 60 miles an hour than he is walking along the street or even in his own home.

"This increase in the safety of the traveling public has been brought about largely by the voluntary action of the railroads themselves, for, in addition to their regard for human life, the greater the safety of passengers and employees, the greater the efficiency in operation, which is the measure of success in railroad management.

"Installations voluntary made by the railroads of automatic signals, heavier and longer rails, steel cars, steam-heated cars, vestibule equipment, electric lighting, highway crossing protection and other improvements, were made with the object of protecting the public and saving human lives. In addition, millions of dollars are being expended annually in 'safety first' work.

"The article charges the railroads with undue delay in installing automatic train control devices on their lines. Under the order issued by the Interstate Commerce Commission on June 13, 1922, designated as Order No. 1, the railroads were required to equip 7,641 miles of track with train control devices, at an estimated cost of $25,000,000. Under Order No. 2 issued on January 1, 1924, an additional 7,440 miles were ordered to be equipped at a further cost of $25,000,000. Of the 7,641 miles required by the first order, all have been completed except 500 miles which will be finished within the next few months. Under the first order of the commission, it has been necessary to equip nearly 4,000 locomotives.

"Of the 7,440 miles of track required under Order No. 2, a total of 2,860 miles has been completed on 13 roads and additional mileage is being completed each month. This means that more than 10,000 or over two-thirds of the 15,000 miles required under both orders have been equipped with train control devices which are in operation.

"The two orders of the commission affect only about 7½ per cent of the total mileage of the Class I railroads and to equip all the passenger lines with train control devices, should a practical device or devices be developed, would involve an estimated expenditure of not less than $665,000,000, which cost eventually would fall on the shoulders of the public.

"The article assumes that a practical device has been perfected. It is the opinion of the vast majority of railroad officials, including signal and operating officers, that no system of automatic train control has yet been developed to that state of physical performance which renders it feasible to warrant its application on the railroads on the scale that is necessary to equip the entire country. Many of the train control systems which have been offered are in the experimental stage, not yet having even reached an effective stage of development. The anonymous writer of this article recommends for adoption the system now in use on the Rock Island Railroad. Notwithstanding the fact that this system has been in process of development on that line for a number of years, no other railroad has adopted it. It is inconceivable that in the thorough and strenuous search which the railroads have made for a system to meet operating conditions, they would not further extend the use of any system which would properly meet their conditions.

"The anonymous writer of this article refers in commendatory language to the character of locomotive engineers. The voice of locomotive engineers has been heard with respect to this very problem. Mr. Warren S. Stone, late Grand Chief of the Brotherhood of Locomotive Engineers, testified before the commission that he felt a new type of accident, more serious than any accident that it could prevent, would be developed by the use of train control which would take the control of the train from the enginemen.

"The position of the railroads with respect to the orders on automatic train control issued by the Interstate Commerce Commission has been misrepresented. When the first order was issued the carriers took the position that the requirements of this order were sufficient fully to develop adequate types of train control so as to enable the selection of a practical and workable device. This is still their position. They felt furthermore that this first order had come prematurely and had been issued before experiments with train control systems had reached a stage which justified such extending of the installation. Consequently the carriers felt in respect to the second order requiring a largely increased expenditure that no further action should have been taken by the commission until the requirements under the first order had clearly shown the extent to which experience had produced a proper device.

"The railroads hope that when the 15,000 miles required under both orders has been equipped, sufficient time should be allowed to elapse so that all the types of train control offered may be developed and placed on as practical a basis as automatic block signals. As a matter of fact, automatic train control only provides against those accidents that may occur from the temporary incapacity or lack of alertness of the engineer, whereas automatic block signals provide against accidents that are liable to occur at any moment. The last statistics issued by the Interstate Commerce Commission show more than one-third of the fatalities due to train operation occur at grade crossings. The elimination of grade crossings would be far more to the public interest than train control, but it is recognized from a practical standpoint that the elimination of all grade crossings would require the expenditure of nearly as much money as it would cost to build the railroads. This would place a heavy burden upon the public and therefore must be done gradually.

"The railroad managements of this country do not set up dollars against safety. They do not feel justified, however, in spending enormous sums of money on the extensive installation of an experimental device when they can accomplish much greater results in the promotion of safety by expending the same amount of money in developing means of providing safety that will affect a greater proportion of the population of this country and will produce greater results in conserving human life and happiness.

"In order to equip the railroads with train control devices, it is necessary in practically all cases to borrow the money. To borrow the money it is necessary to have the proper credit. * * * Because of this fact it may readily be seen those safety measures must be adopted which will give the greatest amount of safety for the money available for that purpose.

THE FORT WORTH BELT RAILWAY and the Fort Worth Stock Yards have contracted with the Metropolitan Life Insurance Company, New York City, for group insurance for their employees, numbering about 200.

Some Economic Problems of Single Track Block Signaling*

By Burt T. Anderson
Superintendent of Signals, Chesapeake & Ohio, Richmond, Va.

THE Chesapeake & Ohio is now completing a 125-mile single-track installation of automatic color-light signals and intermittent induction train control on the territory covered by I. C. C. Orders 1 and 2 between Orange, Va., and Clifton Forge. The old train control and signal installation installed by the railway in accordance with I. C. C. Order 1 has been of interest in many respects and many of the problems entering into the new installation may be of equal interest. As this installation is not yet completed it is too early to go into many details of the installation, but I do desire to bring to your attention some of the economic factors entering into the installation which may be of interest.

The problem before the railroad was primarily one of economics. The first installation had cost over a half-million dollars since the first experiments on train control were started in 1916. Naturally the railroad did not now desire to see all of this expense wasted, even though a portion of the material had to be thrown aside.

The traffic in this territory is very light compared with that on the remainder of the Chesapeake & Ohio main lines. There are only three through and two local passenger, one express and three freight trains a day, or a total of nine trains in each direction daily over the majority of the territory, although between Gordonsville, Va., and Lindsay, 6 miles, the traffic amounts to 40 trains per day. But the traffic on the entire distance was not such as to warrant automatic signals as an economic proposition and hence all the trains in this territory were moved by a train order and manual block system before a train stop system was installed. It was natural, therefore, in meeting I. C. C. Orders 1 and 2 that the simplest kind of an automatic signal and train control installation should be considered.

Installation Includes Grade Signals

Color-light signals and a ramp train control had been in service previously on 61 of the 125 miles now covered by the two I. C. C. train control orders. There were many factors entering into the old installation which were not satisfactory so that in considering the new extension it was proposed to rearrange the old signaling, replace the old ramp train control system with an induction system and use as much of the old signal and train control layout as possible.

While color-light signals had been in use on the 61-mile section, there were three different types of lamp bulbs and wattages in service while a fourth type had been adopted as standard on the remainder of the railroad. The new installation will be of the same type throughout and agrees with the type on other parts of the system. This change will result in a standard stock of material and reduced costs of maintenance and operation. Furthermore, the ramp train control installation was not interchangeable on the 61 miles on either the wayside or the engine apparatus while the same type will be used on both wayside and engines on the new installation.

This territory is in a mountainous region with many curves, several tunnels and grades of 1.5 per cent. On account of the grades it is very desirable to have tonnage trains proceed past the automatic "Stop; then Proceed" signals without stopping. Some grade signals were in use on the old 40-mile installation, the indication being given by red over yellow lights for following movements when a block was occupied. On the new installation an enameled letter "G" has been used as a grade marker on those automatic signals on grades of 0.2 per cent and over on the 125-mile territory. One-half of the automatic signals in this new territory are grade signals.

Variable Block Lengths Are Based Upon a Time Interval

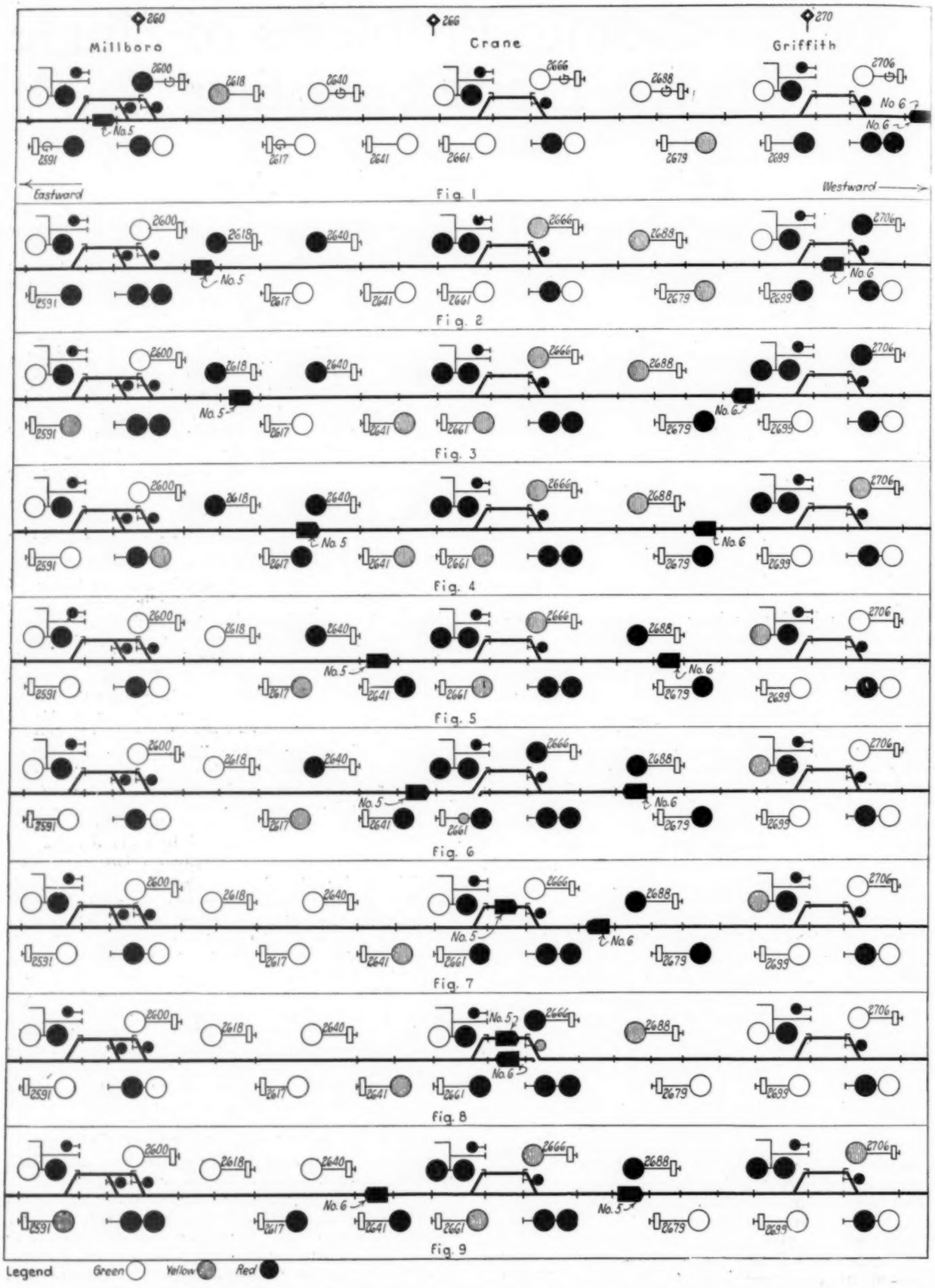
Probably the first and most important economic problem was the location of the signals and the length of blocks. Both operating and signal officers were of the opinion that the old signals between passing sidings were too close together, in many cases less than a mile apart, for the small amount of traffic using the line, especially since block signals were 1½ to 3 miles apart on other sections of the road with three to four times the traffic. The operating department recommended that the blocks be not over seven minutes apart and that they be located on a time basis, rather than a mileage basis, and based on the slowest train on the division. Observers then rode different trains over the entire 125 miles and noted the time at the mile posts from passing siding to siding. From these records the intermediate signals were located. The block lengths varied from 1 to about 3 miles, depending upon the distance and grade between the passing sidings. By relocating the signals according to this basis it was found possible to retire about 60 automatic signals from the old 61-mile installation and relocate them on the new 64-mile territory with a considerable saving in capital account. It is of interest to state that where the new signals have been relocated on a time basis (which is now about 80 per cent completed) the operating results have been very satisfactory.

This system of locating signals has been used in subway work but usually the mileage basis has been used in laying out the ordinary automatic signal system. It is believed that the time basis should be given greater consideration in laying out new signal systems.

Type of Power and Battery Installation

Twenty-one miles of the old installation was of the d-c. primary battery type and 40 miles was of the a-c. type. The d-c. section, with train control, cost about $4,000 per mile and the a-c. cost over $8,000 per mile. The railroad was then confronted with the problem of either extending the primary d-c. system or the a-c. system. Both have their advantages. The signals were approach lighted on the 21 miles, except at a few signals. On the 40 miles the signals were continuously lighted. The main disadvantage with the r-c. system had been the

* Abstract of paper presented at A. R. A. Signal Section Convention, Los Angeles, Calif., September 8, 1926.



Figures 1 to 9 Inclusive, Showing in Progressive Stages the Signal Indications in Advance of and in the rear of Trains 5 and 6 Between Millboro, Va., and Griffith

lack of a reliable emergency power service. On a later automatic signal and interlocking installation the railway had adopted the a-c. floating system with primary battery track circuits and, as the service was both economical and reliable, it was finally decided to change out the old 61-mile installation to the a-c. floating system and make the entire 125 miles of one type with all signals normally a-c.; and d-c. in emergency.

Data will be available later showing in detail the economy of the a-c. power system with primary reserve or with storage battery reserve. It is of interest to report at this time that all of the storage batteries used on the old train control engine equipment were furnished to the signal department for use as reserve batteries on a 50-mile portion of the new signal installation which made it unnecessary to obtain an equal number of new storage batteries.

Typical Track and Signal Layout

The Chesapeake & Ohio has been one of the few railroads locating the absolute block signals on single track at the clearance point rather than beyond the head block at passing sidings. In order to show a typical passing siding with signals the accompanying drawings have been prepared showing the signaling between Millboro, Va., and Griffith. These show the signal indications for trains No. 5 and No. 6, which meet daily at Crane at 9 p. m. It will be noted in Fig. 1, that Crane is 6 miles from Millboro, with two pair of intermediate signals, while Griffith is 4 miles from Crane with one pair of staggered signals about 5,870 ft. apart. On a time basis the first signal leaving a passing siding is much closer to the siding than the signal approaching the siding, as shown by the signals from Crane to Griffith. In nearly all cases one of the absolute signals at a passing siding location is on a bracket post or cantilever mast.

The automatic signals are of the one-light three-indication type, except that absolute signals are of the two-light three-indication type. Movements off the passing siding to the main line are protected by one-light dwarf signals. Signals whose most restrictive indications are more favorable than "Stop" are equipped with a number plate.

Figures 1 to 9 inclusive show in progressive stages the signal indications in advance of and in the rear of trains No. 5 and 6 between Millboro and Griffith, the successive positions and signal indications being as follows: Figure 1 shows train No. 5 proceeding west on main track at Millboro. It is protected by automatic signals *2591* at "Stop; then Proceed" and *2571* (not shown on Fig. 1) at "Approach." Opposing automatic signal *2600* is at "Stop; then Proceed," and *2618* at "Approach." The westward automatic signals are at "Proceed." Opposing train No. 6 is proceeding east approaching Griffith. The opposing absolute signal is at "Stop," automatic signal *2699* is at "Stop; then Proceed" and *2679* at "Approach." The eastward automatic signals are at "Proceed." Train No. 6 meets train No. 5 at Crane, No. 6 passing by on the main line while No. 5 is in the siding.

Figure 2 shows train No. 5 approaching signal *2617* and protected by absolute "Stop" signals at Crane and Millboro. Train No. 6 is about to enter the absolute block between Griffith and Crane. Signal *2688* is 5,700 ft. from the eastbound absolute signal at Griffith and about 12,000 ft. from signal *2666* although on a time basis the blocks are the same length. Westbound block *2679* is 11,500 ft. in length and the block in the rear 6,400 ft. in length.

Figure 3 shows train No. 5 and 6 advancing towards "Approach" signal *2688* and "Clear" signal *2617*. The second signal in the rear of train No. 5, signal *2591*, has changed to "Approach" permitting following movements. Train No. 6 is still on the overlap of signal *2706* which is displaying the "Stop; then Proceed" indication. Both trains are now protected by absolute "Stop" signals for opposing and following train movements. Note that two "Approach" signals, or a so-called "Double Distant," are in the rear of the absolute "Stop" signals at Crane.

Figure 4 shows train No. 5 advanced into the block of *2617* and No. 6 advanced beyond the overlap of signal *2706*. Both trains are still protected by absolute "Stop" signals at Crane for opposing movements and with a "Stop; then Proceed" signal for No. 5 and an absolute "Stop" signal for No. 6 for following movements. On account of the mountain grades signals *2617* and *2688* are equipped with the letter "G" which permits tonnage trains to pass without a stop being made. Note that 7 out of the 12 automatic signals shown are grade signals, also note that two "Approach" signals are still in the rear of the absolute "Stop" signals at Crane.

Figure 5 shows trains Nos. 5 and 6 approaching

Legend: Green ○ Yellow ● Red ●

Orange to Clifton Forge Virginia
Color Light Signals
Names, rules, aspects and indications

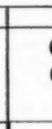
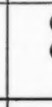
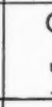
	Automatic Block Signals								Special Automatic Dwarf Signals	
Diagram	1	2	3	4	5	6	7	8	9	10
Aspect										
Given by	Two Red Lights	One Red Light And Number Plate	Red Light Over Yellow Light And Number Plate	Yellow Light Over Red Light	One Yellow Light and Number Plate	Green Light Over Red Light	One Green Light And Number Plate	Red Light Over Letter "G"	One Red Light	One Yellow Light
Name	Stop Signal	Stop and Proceed Signal	Permissive Signal	Approach Signal		Clear Signal		Grade Signal	Stop Signal	Approach Signal
Indication	Stop	Stop; Then Proceed	Proceed from Main Line to Siding at Slow Speed Prepared to Stop Short of Train or Obstruction	Approach Next Signal Prepared to Stop		Proceed		For Tonnage Freight Trains Proceed in Accordance With Rule 509-D	Stop	Approach Next Signal Prepared To Stop
Rule	501-A	501-AA	501-G Special	501-B		501-C		504-D	501-A,Spec.	501-B,Spec.

Fig. 10—Color-Light Signal Indications Used on the Chesapeake & Ohio Installation

Crane, the meeting point, with signals *2666* and *2661* at "Approach" and protected by opposing absolute "Stop" signals and "Stop; then Proceed" and "Approach" following signals.

Figure 6 shows train No. 5 about to enter the east end of Crane passing siding, proceeding by signal *2661*, now a permissive signal on a "Red over Yellow" indication without stopping. Signal *2666* is now at "Stop; then Proceed," due to No. 5 being on the overlap circuit and the siding switch being reversed. Train No. 6 approaches signal *2666* prepared to stop due to receiving an "Approach" indication at signal *2688*. All entering signals at passing sidings are equipped with a second yellow light for providing a movement into the siding without a stop at a red signal. This yellow light is normally out and is only displayed when the passing siding switch is reversed. If No. 6 arrives ahead of No. 5, the siding switch is reversed by the trainman of No. 6.

Figure 7 shows train No. 5 in Crane siding. Signal *2666* is at "Proceed" for train No. 6, which now has clear signals ahead. No. 5 waits on the siding until No. 6 passes and the westward absolute signal at Crane is at "Proceed." This indicates that the block to Griffith is clear and it is proper to reverse the switch and obtain the "Approach" signal indication for the movement through the absolute block.

Figure 8 shows train No. 6 proceeding eastward with clear signals while train No. 5 comes out of the siding on an "Approach" indication. The westward absolute signal at Crane is at "Stop," protecting following movements for No. 5 while the eastward absolute signal at Griffith will go to "Stop" for protection against opposing movements as soon as No. 5 passes the dwarf signal at the entrance to the absolute block.

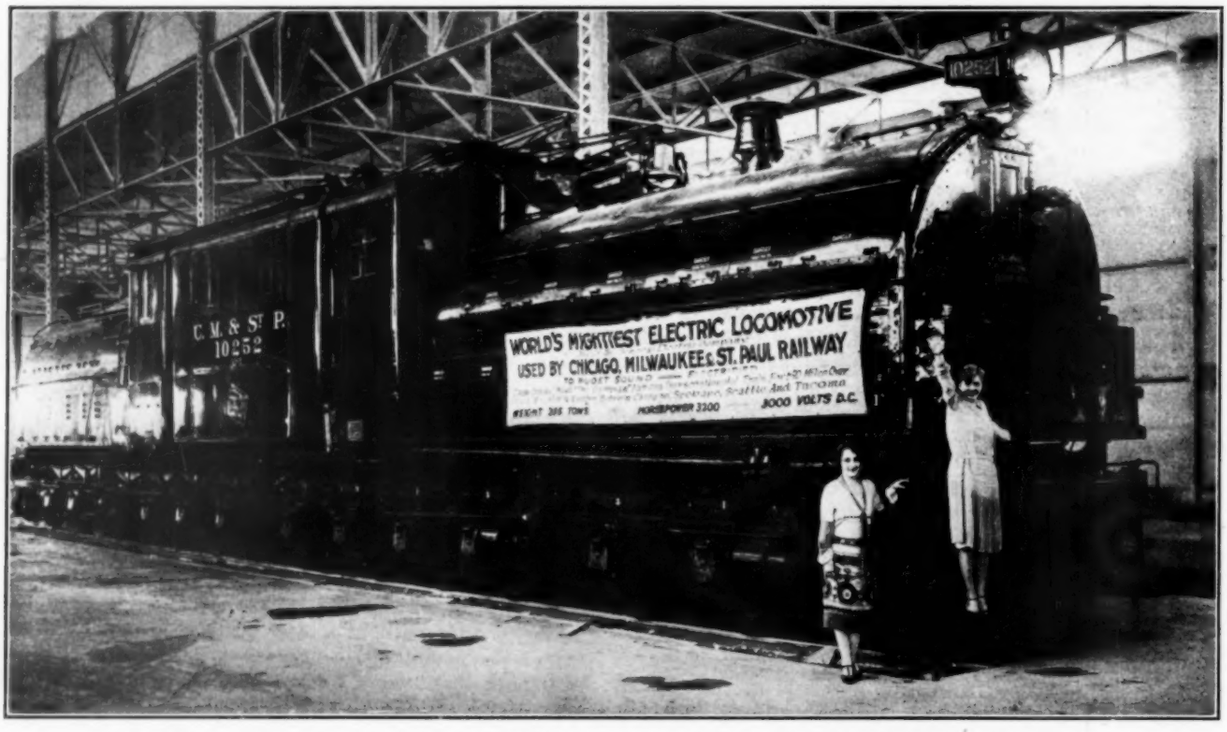
Figure 9 shows Nos. 5 and 6 past the meeting point at Crane, both on the main line track, and protected by absolute "Stop" signals for opposing and following movements. As the trains proceed through the automatic blocks signals will protect them as shown on previous diagrams. The color-light signal indications used are shown in Figure 10. They are based on the old A.R.A. code, are few in number, and have been in use satisfactorily on sections of the new work already in service. Figure 10, diagram 1, shows the "Stop" indication, one of the most important indications in the book of rules. In the past the absolute signal was marked by a painted letter "A" but only one light was used, as on all automatic signals. The bottom light is always red and is simply used as a marker. The absence of one or more of the two lights is an imperfectly displayed signal and indicates "Stop."

Diagram 2, Figure 10, is the "Stop; then Proceed," automatic signal indication, while diagram 3 is the special permissive signal only provided for trains entering the passing sidings. "Approach Signals" are shown in diagram 4 and 5. The two clear signals, the grade signal and the two dwarf signal indications are shown in diagrams 6, 7, 8, 9 and 10.

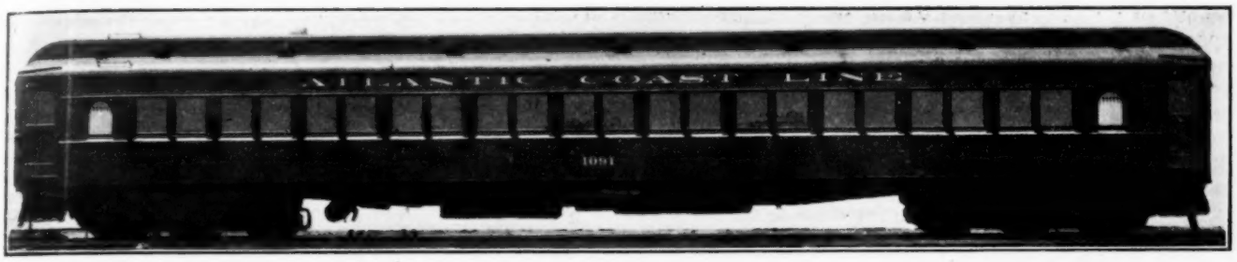
These diagrams have been made for the purpose of educating the trainmen and other employees operating over the signal territory. It is believed that this method of instructing the employees will be of greater value than the more simple methods used in the past.

Economy of Automatic Signaling

While it is too early to know the economic benefits derived from this installation it is known that, in addition to the increased safety of train operation, it will be possible to close up some of the telegraph offices, reduce the number of written train orders, lengthen the maintainer's sections, reduce the capital investment charges on the old signal territory and provide a more reliable signal and train control system. Completion of this stretch of automatic signaling gives the Chesapeake & Ohio a 598-mile line which is 100 per cent signaled between Washington, D. C., and Cincinnati, Ohio.



C. M. & St. P. Electric Locomotive on Exhibition at the Sesqui-centennial Exhibition, Philadelphia



Day Coach Built for the Atlantic Coast Line by the Pullman Car & Manufacturing Corporation

All-Steel Coaches for the A. C. L.

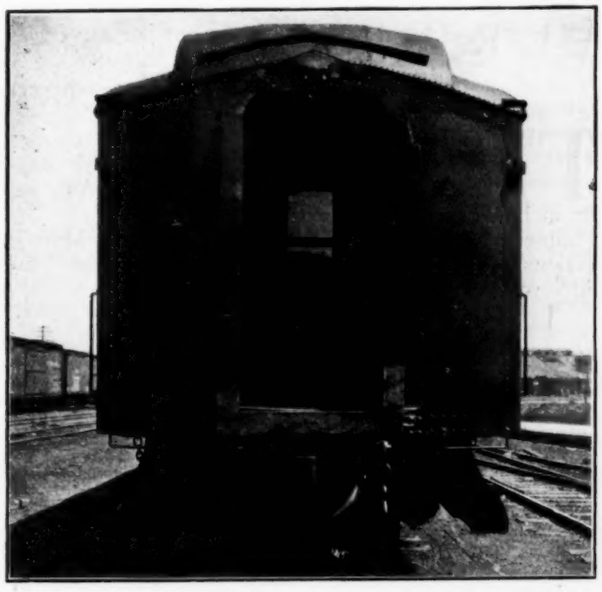
Are well equipped with facilities for the comfort of passengers—Seating space is divided to provide smoking compartment

THE Atlantic Coast Line has recently placed in passenger service a number of coaches of all-steel, fireproof construction. These coaches, which were built by the Pullman Car & Manufacturing Corporation, have an inside length of 73 ft. 8 in. and a length over the end sills of 74 ft. 4 in. The inside width

Interior View of the Passenger Compartment

is 9 ft. 0⅝ in. They have a seating capacity of 88 persons, the seating space being divided into two compartments, one of which is used for a smoking room with seats for 24 persons. A men's saloon and washroom is located in the smoking room end of the car. The saloon and toilet room for the women are located at the opposite end. Referring to the drawing, both the men's and women's washrooms are located in a compartment separate from the toilet. This arrangement not only permits greater convenience and accessibility, but affords additional space in the toilet room which the average traveller will appreciate. The wash stand, above which is placed a 22-in. by 34-in. wall mirror, has a table top around the wash bowl of ample area, providing plenty of space in which the user may lay toilet articles, etc. The women's toilet has an additional mirror, 18 in. by 34 in., which is placed on the wall opposite the mirror over the wash stand. The women's saloon is also provided with a seat placed across one end of the saloon compartment.

A feature in the construction of these coaches is the system of ventilation which has been designed to provide comfort, especially during the hot weather months when traveling is especially irksome and uncomfortable in the southern states unless extra pains is taken to lessen the heat. The upper deck girders are fitted with 13 ventilators of Railway Utility Company manufacture, and four intake screens made by the car builders. Five electric fans provided with revolving diffusion vanes, furnished by the Safety Car Heating & Lighting Company, are



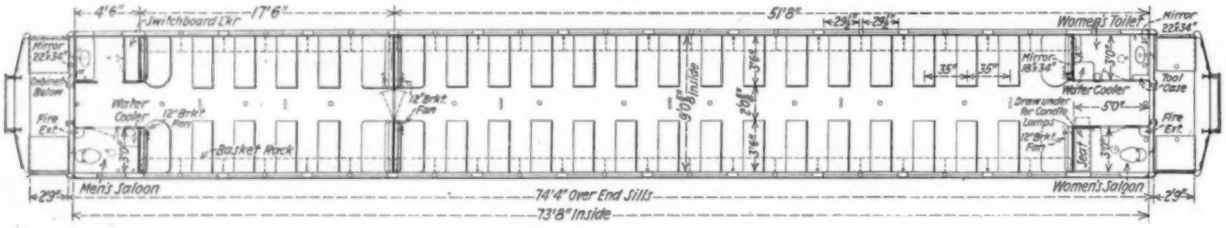
End View of the Atlantic Coast Line Day Coaches

set in the ceiling as shown in one of the illustrations. The smoking compartment is provided with an extra exhaust fan in order to obtain more rapid circulation of the air. In addition to the ceiling exhaust fans, 12-in bracket fans are placed at both ends of the passenger compartment and at the vestibule end of the smoking compartment.

The interior of the cars is finished with Vitralite

enamel of a soft gray green on the walls, bulkheads and upper deck, while the headlining is finished in light gray enamel. The center lamps consist of 10 Pullman standard type fixtures equipped with Berylite bowls. Flexolith flooring, supported on steel arched plates, is laid the full length of the interior of the car, which allows for thorough sanitation. Continuous parcel racks provide ample space for hand baggage, and hooks located between the windows may be used for coats, etc. Pressure water coolers, furnished by Henry Giessel Company, are located at both ends of the car.

The exterior of the car is finished with Duco of the standard Pullman green shade. The trucks are of Commonwealth cast steel, six-wheel type, with straight equalizers and Simplex clasp brakes which permit ready access for inspection. The air brake equipment is of



Floor Plan of the Atlantic Coast Line Coaches

Westinghouse design, UC schedule, and each truck is braked separately by a 14-in. cylinder. The hand brakes provide a braking power equal to that furnished by the air brakes. The roofs and deafening floors are of copper bearing steel, the roof material being galvanized for further protection.

A. E. R. A. Report on Heavy Electric Traction

THE report of the committee on heavy electric traction presented this week at the annual meeting of the American Electric Railway Association included six subjects.

Subject No. 1 is entitled "Review Existing Manual Sections." These sections were reviewed and the committee recommended no changes.

Bonding

Subject No. 2, covering an investigation of rail bonds is a new activity of the committee, and data were gathered by means of a questionnaire covering present bonding practice which are summarized in the table:

	Electrified steam railroads	Heavy electric traction lines	Total
Track Rail Bonds			
No. of companies reporting	19	6	25
No. of bond installations	22	7	29
Mechanically applied bonds	14	5	19
Concealed and semi-concealed	10	3	13
Exposed	3	2	5
Both	1	..	1
Pin expanded terminal	13	..	13
Compressed terminal	1	5	6
Heat applied bonds	8	2	10
Gas weld	6	1	7
Electric weld	1	1	2
Brazed	1	..	1
Third Rail Bonds			
No. of companies reporting	7	6	13
No. of bond installations	8	7	15
Mechanically applied bonds	4	4	8
Pin expanded terminal	1	..	1
Compressed terminal	3	4	7
Heat applied bonds	4	3	7
Gas weld	2	1	3
Electric weld	1	1	2
Soldered	1	1	2

Comments of the committee relative to the data given in the table are as follows:

Track Rail Bonding

"As the mechanically applied bond is the oldest type in general use while the heat bond applied in heavy traction service is only a comparatively recent development, it is obvious that the former type will be found in a majority of the installations amounting to 65 per cent of the number reported. This type is used in sizes ranging from No. o A.W.G. to 500,000 c.m. and varying in length from 9 in. to 53.25 in. The pin expanded terminal bond predominates, representing 69 per cent of the number of installations of mechanically applied bonds which is probably largely due to the fact that this type can be installed and maintained very easily under traffic and without requiring the use of cumbersome or expensive tool equipment.

"The advantages and disadvantages claimed for the mechanically applied bond may be summed up as follows:

Advantages—Easy to install. Wide range in choice of length of bond and flexibility of design to suit rail joint. Low labor cost of application and replacement. Only small and inexpensive tool equipment required for installation.

Disadvantages—High first cost. Necessity of being designed to suit the rail joints, length being fixed by splice bar and bolt hole spacing. Larger capacity than otherwise necessary when long lengths are required. Uncertainty of securing and maintaining uniform and low contact resistance.

"Heat applied bonds, particularly of the welded type, have reached a successful stage of their development only within the past few years with the consequence that this type is not as yet in sufficiently wide use under heavy traffic conditions to permit drawing definite conclusions as to its merits compared to the mechanically applied bond in this class of service. The sizes range from No. o A.W.G. to 250,000 c.m. while their developed length varies from 7 in. to 15.5 in. Seventy per cent of the installations reported are using the gas weld type of bond.

"The advantages and disadvantages claimed for the welded type of bonds may be summed up as follows:

Advantages—Low resistance due to short length and character of contact. Use of small capacity bonds, all being 250,000 c.m. or less. Easily inspected. Uniformity of design. Permanency of contact and consequently permanency of contact resistance providing the weld holds.

Disadvantages—Skilled operators are required for installation. Special and more or less cumbersome tool equipment is necessary. Bond is exposed to mechanical injury and theft. Limited to rail head application.

Third Rail Bonding

"Due to the various kinds and shapes of third rail in service, third rail bonds are necessarily of a more or less special type and the design must be adapted to the type of rail with which used. It will be noted that the mechanically applied types represent a smaller proportion of the total installations for third rail bonds than for track bonds, amounting to but 53 per cent as compared with 65 per cent for the latter. The size of the bond varies from No. 0000 A.W.G. to approximately 2,500,000 c.m. and the number of bonds per joint from one to four. Comparatively little opportunity is offered for standardization of third rail bonding practice because of the widely differing types of third rail construction."

The effect of heat of welded bonds on track rails was considered and the committee recommended that this study be continued and that the committee co-operate with the committee on way and structures.

Work was also done toward the development of a standard basis for measurement of bond resistance. Methods are outlined in the report for calculating bond

resistance, for measuring it in the field and for making laboratory tests.

Bibliography

The bibliography of heavy electric traction and electrification data, subject No. 3, has been brought up to date as of January 1, 1925, covering a selected group of technical journals. It is available at the offices of the Association but as yet has not been published because of the expense involved. The committee recommends, however, that the bibliography be published either by the Association or by some means in which advertising is included to defray the cost of publication.

Branch Line Electrification and Self-Propelled Cars

In consideration of subject No. 4, "Branch Line Electrification and Self-Propelled Cars," the report states that by this means the economic conditions of branch lines now run at a loss may be improved. It is the opinion of the committee, however, that the collection of data concerning motive power for branch lines should be deferred another year, in order that a wider variety of and more reliable figures may be available.

Articulated Train Operation

A total of 173 articulated trains are operated in the United States and Canada by five railways and there are nearly a hundred more under construction or on order, according to the data included under subject No. 5, "Articulated Train Operation." Practically all of these trains are in urban service. Plans and elevations of articulated cars are shown in the report together with a table outlining the general characteristics of the equipment and the kind of service in which it is used.

Locomotives and Multiple Unit Cars

Under subject No. 6, "Revision of Tabulated Data on Electric Locomotives, Multiple Unit Cars and Trains," the committee reviewed the data originally submitted a year ago and rearranged the tabulated data which are included in the report. The multiple unit train data is limited to American installations, but the locomotive data includes the electric locomotives of the world. With the tables are charts classifying cab arrangements and wheel arrangements, respectively, in which the European classification symbols are used.

The report is signed by A. H. Armstrong, H. W. Cope, A. H. Daus, John C. Davidson, J. H. Davis, J. V. B. Duer, James T. Hamilton, E. C. Johnson, Norman Litchfield, John O. Madison, M. W. Manz, L. S. Wells, A. H. Woollen, Charles R. Harte, sponsor, Morris Buck, secretary, J. M. Bosenbury, vice-chairman and H. F. Brown, chairman.

The K. C. S., the M-K-T and St. L. S. W. Merger Hearing

A HEARING on the application for authority for the acquisition of control of the Missouri-Kansas-Texas by the Kansas City Southern and of the St. Louis Southwestern by the Missouri-Kansas-Texas was opened before D. C. Mahaffie, director of finance of the Interstate Commerce Commission at Dallas, Tex., on September 28. L. F. Loree, chairman of the board of the Missouri-Kansas-Texas and the Kansas City Southern, was one of the first witnesses called. He plans to combine the Missouri-Kansas-Texas, the Kansas City Southern and the St. Louis Southwestern into one system through joint stock control. Among the opponents of the plan are certain short line railroads, chief of which is the Waco, Beaumont, Trinity & Sabine. In addition, the minority stockholders of the St. Louis Southwestern, New Orleans interests, Oklahoma shipping interests and Texas interests are opposed.

In his testimony, Mr. Loree stated that 4,000 miles of the 30,000 miles of railroad in the United States that should be abandoned are in the Southwest and the communities served by these lines when abandoned should resort to trucks and passenger automobiles. The stronger lines should not be forced to support the weaker ones. He said that under this consolidation the Kansas City Southern should have an outlet to New Orleans and that if it could not be provided otherwise he would advocate the purchase of the Louisiana Railway & Navigation Company. The Kansas City Southern has recently made an effort to buy the Louisiana Railway & Navigation Company but no price could be determined. As an alternative, he suggested that the outlet might be secured by building from a point near Beaumont and using the Southern Pacific into New Orleans.

J. F. Holden, vice-president in charge of traffic of the Kansas City Southern, testified that the growing southwest needs a separate rate territory in railroad grouping and the alliance will create a strictly southwestern system. The competing systems which have mileage in the southwest were given by Mr. Holden as the Atchison, Topeka & Santa Fe, with 6,825 miles, the Missouri Pacific with 10,480 miles, the Southern Pacific with 4,565 miles, the St. Louis-San Francisco with 5,190 miles, the Chicago, Rock Island & Pacific with 3,473 miles, and the Illinois Central with 193 miles. He pointed out that the St. Louis-San Francisco desires to absorb the Chicago, Rock Island & Pacific which would give the combination 8,663 miles in the southwest, thereby strengthening the competition against the three lines in the proposed consolidation. Under the merger of the three companies the lines will be considered as one system and a one-system rate can be established. The consolidation would bring a greater volume of traffic to the Missouri-Kansas-Texas and the St. Louis Southwestern by giving them access to traffic from and to industries on the Kansas City Southern. The merger would expedite traffic and be beneficial to commercial interests by making all team tracks available to each line since there are a large number of team tracks on the Kansas City Southern at Kansas City, Mo., Shreveport, La., Port Arthur, Texas, Texarkana, Ark., and other points, with competition between the applicant lines in existence.

Following the testimony of C. N. Whitehead, president of the Missouri-Kansas-Texas, R. C. Duff, president of the Waco, Beaumont, Trinity & Sabine, in cross-examination, attempted to show that the Missouri-Kansas-Texas had been sympathetic to the Waco, Beaumont, Trinity & Sabine, and that this friendship should continue. The Missouri-Kansas-Texas had at one time favored the extension of the Waco, Beaumont, Trinity & Sabine into Port Arthur, Texas, but according to Mr. Whitehead, with the consolidation of the Katy with the Kansas City Southern the Katy cannot assist the Waco, Beaumont, Trinity & Sabine. In answer to Attorney Fulbright for the Houston Chamber of Commerce, Mr. Whitehead stated that if the Katy has fourth morning delivery of freight at Waco from St. Louis, Mo., the Cotton Belt after the merger will be permitted to reduce its time to a third morning delivery if practical and there would probably be a consolidation of terminals at Waco with no change in switching charges.

V. W. Kirkpatrick, valuation engineer of the Kansas City Southern, valued this road at $91,012,322 in order

to show the expected financial strengthening which would result from the merger. On this valuation the net operating income of the Kansas City Southern for 1925 was $5,237 a mile, or a total of $4,093,436, while that of the Katy was $4,023 a mile, or a total of $12,825,624 and the Cotton Belt $2,753 a mile, or a total of $4,817,854.

Electric Lines Voice Optimism at Cleveland Convention

THE American Electric Railway Association held its annual convention at Cleveland, Ohio, on October 4-8 with approximately 7,000 in attendance from the electric railway supply and related fields. Approximately 100 steam railroad officers were in attendance. In connection with the convention there was an exhibit of comprehensive scope of electric railway and bus equipment and supplies.

The convention embraced all the different departments of street railway activity—accounting, engineering, mechanical, claims, purchases and traffic, both for the electric railways themselves and for their bus subsidiaries.

The keynote of the convention, indicated in the opening address of President Coates, was the necessity of the electric railway to the economic life of the country and the evident indication that the industry was going forward. "A few short years ago," he said, "there were those who professed to see the electric lines skidding into innocuous desuetude. Today, what do we see? The greatest convention this association ever has had, the greatest assemblage of transportation men, the greatest exhibit of transportation equipment and material. That's going some for an industry that was supposed, five years ago, to be due for the scrap pile."

Mr. Coates emphasized the importance of the bus, coordinated with the railway, in rendering an adequate transportation service to the public.

The underlying idea of merchandising transportation, of an industry modernizing its equipment and its methods to bring increasing business, was evident throughout the convention. This idea was stressed by several speakers, among them Britton I. Budd, president of the Chicago, North Shore & Milwaukee.

"The old theory held by many" said Mr. Budd, "that electric railway service, being a necessity, was used only in case of necessity, and therefore did not require any special effort to sell it, has been generally discarded. Today I think we all agree that electric railway service can be sold; that is, that the operating revenues of our companies can be increased by well directed sales efforts. I think we are agreed, also, that at no time in the history of electric railways has the need for intensive sales efforts been as great as it is now."

He stressed the value of organized effort among employees to develop them into a selling force and told of a general transportation sales conference participated in by many delegates from among the employees.

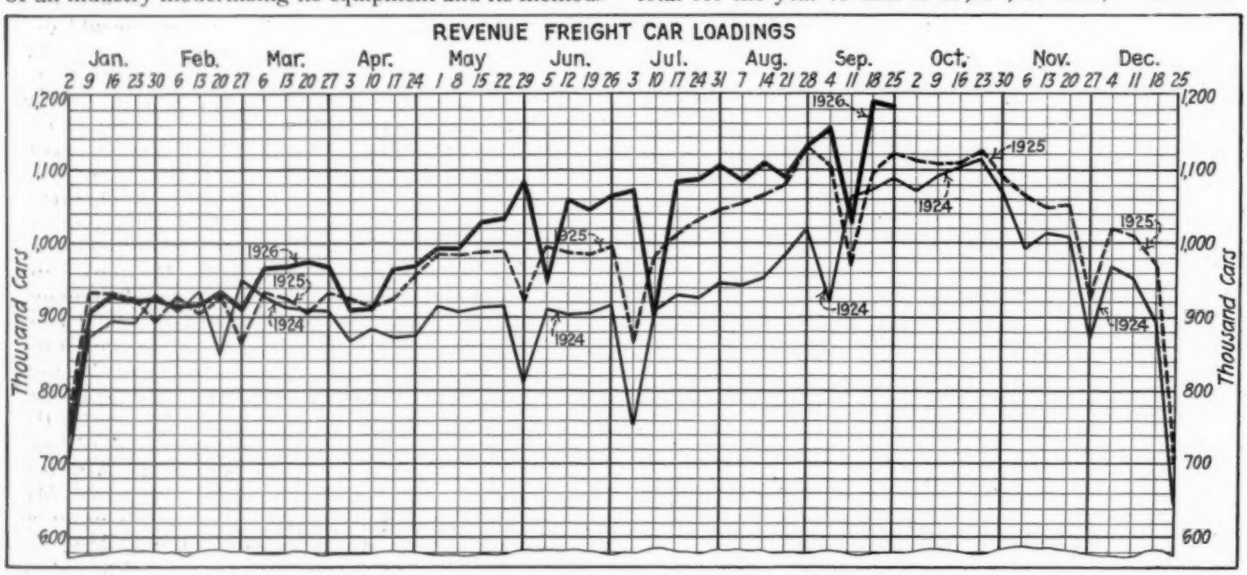
"We held two full-day sessions," he said, "beginning at 9 o'clock in the morning and lasting until 5 o'clock in the afternoon. The delegates were on company time and a full attendance was insisted upon. A program was prepared and definite assignments made in advance. Main papers were limited to 20 minutes and discussion to 5 minutes. A great deal of valuable information was developed which each delegate was instructed to present in summarized form to the employees in the department which he represented."

A great deal of consideration was given to the motor bus as a street railway facility—its possibilities and the operating, maintenance and other problems connected with its use. Most of the presentation on this subject is applicable to bus operation by steam railroads as well as by electric railways. Consequently material of this character developed at the convention will be published in the Motor Transport Section of the *Railway Age*, to appear with the October 22 issue.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended September 25 amounted to 1,182,940 cars, a decrease of only 4,071 cars as compared with the record loading of the week before. This brought the total for the year to date to 39,251,889 cars, or an average of over a million cars a week, as compared with 37,892,944 cars in the corresponding week of last year, and this was the eighteenth million-car week this year. As compared with the corresponding week of last year there was an increase of 61,915 cars and as compared



with 1924 the increase was 94,986 cars. Increases as compared with last year were reported in all districts except the Southern and in all commodity classifications except grain and grain products and forest products. As compared with 1924 there were increases in all classes of commodities except grain and grain products. Coal loading again reached a high figure, 211,722 cars, as did miscellaneous freight, 448,270 cars.

The summary, as compiled by the Car Service Division of the American Railway Association, follows:

REVENUE FREIGHT CAR LOADING—WEEK ENDED SATURDAY, SEPTEMBER 25, 1926

Districts	1926	1925	1924
Eastern	271,454	247,905	250,392
Allegheny	238,215	215,775	216,032
Pocahontas	63,048	59,258	49,420
Southern	164,722	167,642	148,616
Northwestern	180,790	175,516	166,576
Central Western	171,331	170,172	181,238
Southwestern	93,380	84,757	75,680
Total Western districts	445,501	430,445	423,494
Total all roads	1,182,940	1,121,025	1,087,954
Commodities			
Grain and grain products	50,915	55,288	69,310
Live stock	39,723	36,854	36,760
Coal	211,722	178,336	194,200
Coke	12,363	11,908	9,391
Forest products	69,865	72,066	68,654
Ore	74,241	55,455	46,176
Mdse. L.C.L.	275,841	272,746	258,468
Miscellaneous	448,270	438,372	404,995
September 25	1,182,940	1,121,025	1,087,954
September 18	1,187,011	1,098,627	1,076,847
September 11	1,031,081	975,499	1,061,781
September 4	1,151,346	1,102,785	921,303
August 28	1,136,233	1,124,438	1,020,809
Cumulative total, 39 weeks	39,251,889	37,892,944	35,701,943

The freight car surplus is fast disappearing and for the week ended September 14 averaged only 137,377 cars, including 35,387 coal cars, 74,389 box cars and 8,590 refrigerator cars, but the shortages reported amounted only to 63 cars.

The Canadian roads for the same week had a surplus of 17,850 cars, including 15,950 cars.

Car Loading in Canada

Revenue car loading at stations in Canada for the week ended September 25 totalled 75,454 cars, a decrease of 715 cars from the same week last year. Lighter grain loading in the Western division was the chief factor. The total loading for the Eastern division increased 2,987 cars, while for the Western division there was a decline of 3,702 cars.

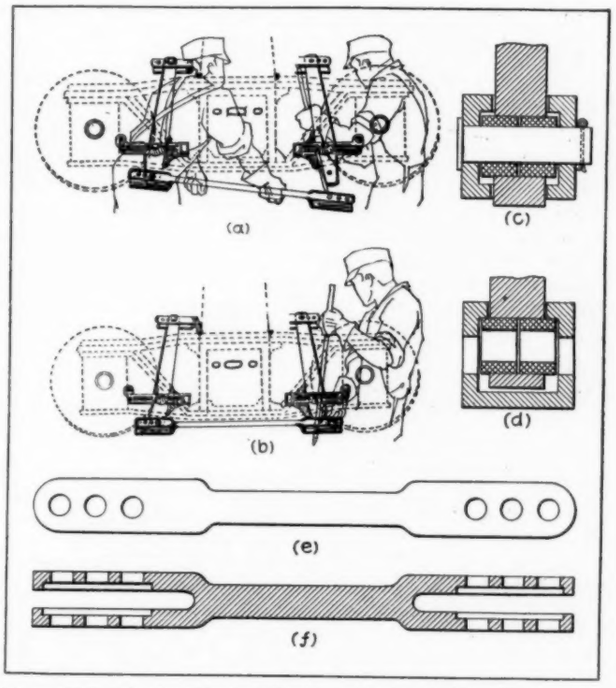
	Total for Canada			Cumulative totals to date	
	Sept.25,	Sept.18,	Sept.26,		
Commodities	1926	1926	1925	1926	1925
Grain and grain products	17,646	15,922	22,424	267,646	256,184
Live stock	2,943	2,645	2,821	78,688	86,172
Coal	8,362	7,309	6,588	207,435	134,403
Coke	356	323	372	13,682	10,543
Lumber	3,777	3,465	3,856	138,578	136,439
Pulpwood	1,890	2,033	1,822	106,124	102,520
Pulp and paper	1,992	2,145	2,107	91,113	77,351
Other forest products	2,860	2,663	2,305	117,922	106,992
Ore	1,641	2,320	1,680	64,841	52,335
Merchandise, L. C. L.	17,530	17,644	16,556	616,522	579,368
Miscellaneous	16,457	15,583	15,638	532,151	472,961
Total cars loaded	75,454	72,052	76,169	2,234,702	2,015,268
Total cars received from connections	40,245	37,905	34,061	1,412,332	1,256,424

THE NEW YORK CENTRAL and the Big Four have inaugurated a new train between Chicago and Cairo, Ill., which leaves Chicago at 11 p. m. and arrives in Cairo at 12 noon the next day. Returning, it leaves Cairo at 5:30 p. m. and arrives in Chicago at 6:50 the next morning.

Improved Truck Lever Connection

EXPERIENCE has shown that many train detentions are due to brake pins losing out and damaging the brake rigging and in some instances, resulting in derailments and extensive damage to equipment. In an effort to reduce to a minimum, this source of train failures, R. E. McGahey, master mechanic of the Richmond, Fredericksburg & Potomac, at Potomac Yard, Washington, D. C., has devised and patented an improved truck lever connection for freight cars and locomotive tenders. The Schaefer Equipment Company, Pittsburgh, Pa., has taken over the patent rights for the device.

In the application of this connection to equipment, the hole in the lever is slightly enlarged to provide for two



Even Though the Pin is Missing, the Brake Lever Connection is Still Maintained

small steel bushings, one of which projects at each side of the lever. It is optional, however, whether the bushings are used when making repairs while in transit or when in the home shop for general repairs. Where bushings are used they are of benefit in making easy adjustment, because the repairman does not have to drop the rod for this operation and it can easily be done by one man. In the accompanying illustrations *a* and *b* show the old and new methods. When one of these connections is removed for any cause while the car is in transit and it is necessary to supply another type, all that is required to make the brake lever standard is the removal of one section of the bushing.

Section *c* shows the detail application of the lever, bushings and pin, and location of parts when in service. Section *d* shows the safety feature of the connection. Even though the pin is missing as the bushings are against the upper part of the cavity the connection is still retained in place. Section *e* shows a two or three-hole type with closed ends. Section *f* shows a two or three

hole type with open ends. This connection is interchangeable with the numerous standard makes of connections in use today.

Motor Transport Hearing at Kansas City

THE concluding hearing of the Interstate Commerce Commission's investigation into the operation of motor buses and motor trucks, which began in Chicago on July 27, was held at Kansas City, Mo., on September 24 and 25. The outstanding testimony was that of L. G. Reymiller, assistant statistician for the western carriers, who presented exhibits showing the decline in passengers carried since 1920 in the states of Arkansas, Kansas, Louisiana, Missouri, Oklahoma and Texas, besides those showing the decline in the number of passengers carried in 25 western states. The final hearing will be held at Washington, D. C., on October 25.

M. J. Healy, attorney for the Kansas Public Service Commission, testified that the commission favored interstate regulation with as little interference with state regulation as possible. John N. Cornatzar, passenger traffic manager of the St. Louis-San Francisco, stated that Missouri has 81 bus lines which do not observe any established basis or rules in determining their passenger rates. Where there is little or no rail competition, he said, they charge prices equal to or in excess of the regular rail rate. Where there is rail competition, they cut from one-tenth to one-third off the rail rate.

TREND OF PASSENGER TRAVEL INTRASTATE AND INTERSTATE ON SELECTED LARGE CLASS I ROADS IN SIX STATES, YEARS 1920 TO 1925

	Intrastate			Interstate			Total for the state		
Year	Pass. carried, thousands	Ratio to 1920	Average journey, miles	Pass. carried, thousands	Ratio to 1920	Average journey, miles	Pass. carried, thousands	Ratio to 1920	Average journey, miles
Five Roads—State of Arkansas									
1920	10,021	100.00	24.65	3,435	100.00	84.57	13,457	100.00	39.94
1921	6,303	73.73	26.77	2,372	70.27	86.05	9,180	71.86	42.07
1922	5,831	63.32	27.12	2,061	60.88	86.72	7,912	62.00	42.58
1923	6,785	73.82	27.16	2,362	69.95	86.92	9,147	71.73	42.61
1924	5,937	64.38	27.07	2,093	65.97	92.54	8,030	65.24	44.13
1925	4,087	48.48	29.73	1,827	67.70	109.19	5,914	58.86	54.28
Five Roads—State of Kansas									
1920	7,180	100.00	39.56	5,084	100.00	150.36	12,264	100.00	85.49
1921	5,739	82.24	40.75	3,609	69.02	146.36	9,349	72.60	81.53
1922	4,521	63.89	40.12	3,298	66.08	153.11	7,819	65.49	87.78
1923	3,866	57.66	42.79	3,411	70.85	160.36	7,276	67.28	97.90
1924	3,176	48.77	44.39	3,051	65.02	165.75	6,227	60.62	103.86
1925	2,503	41.05	47.74	2,816	62.76	174.61	5,319	56.88	114.91
Six Roads—State of Louisiana									
1920	3,341	100.00	29.26	607	100.00	51.17	6,174	100.00	41.10
1921	2,087	70.00	32.81	456	74.20	50.06	4,030	72.42	45.60
1922	1,711	67.71	34.63	419	76.42	50.22	3,483	71.02	47.77
1923	1,629	63.62	38.21	474	80.90	52.56	3,349	65.35	49.51
1924	1,236	54.32	43.00	423	77.95	56.69	2,591	61.57	60.30
1925	958	47.29	53.98	364	82.68	69.97	1,967	57.32	75.10
Six Roads—State of Missouri									
1920	9,375	100.00	35.07	4,364	100.00	103.35	13,699	100.00	56.83
1921	7,468	82.05	35.97	3,119	73.33	106.06	10,587	77.00	56.62
1922	6,500	75.42	37.95	2,867	66.50	104.51	9,368	70.25	58.33
1923	6,307	79.24	40.85	3,116	76.10	109.41	9,423	77.42	63.52
1924	5,560	70.13	41.82	2,867	70.87	112.93	8,426	70.56	66.01
1925	4,488	64.43	47.61	2,656	70.96	122.05	7,144	68.21	75.29
Five Roads—State of Oklahoma									
1920	11,831	100.00	36.47	4,427	100.00	86.90	16,258	100.00	50.20
1921	8,487	74.13	37.90	3,003	65.05	83.81	11,491	69.85	49.90
1922	6,563	60.05	39.58	2,475	56.05	87.36	9,037	58.16	52.66
1923	6,067	59.79	42.02	2,582	61.84	91.06	8,649	60.76	56.66
1924	5,127	53.09	43.80	2,412	59.40	92.92	7,539	56.07	59.52
1925	3,806	43.42	48.14	2,192	58.19	99.87	5,998	50.38	67.05
Seven Roads—State of Texas									
1920	12,034	100.00	59.98	2,603	100.00	123.39	20,860	100.00	72.32
1921	7,180	59.28	59.89	1,680	62.68	120.42	13,395	64.95	73.71
1922	5,426	45.55	60.88	1,379	55.15	129.08	11,016	55.54	76.70
1923	8,372	52.27	66.25	2,211	71.80	153.34	10,917	61.29	83.35
1924	7,163	51.74	73.25	2,133	70.62	149.40	9,576	58.25	89.61
1925	5,694	43.86	82.42	1,961	69.81	169.50	7,871	52.44	103.35

The exhibits of Mr. Reymiller showed that in the states of Arkansas, Kansas, Louisiana, Missouri, Oklahoma and Texas the number of intrastate passengers carried in 1925 was only 48.48 per cent, 41.05 per cent, 47.29 per cent, 64.43 per cent, 43.42 per cent, and 43.86 per cent respectively, of the intrastate passengers carried in 1920. The intrastate percentages for the same two years were 67.7, 62.76, 82.68, 70.96, 58.19 and 69.81 respectively.

The five railroads of Arkansas, the Chicago, Rock Island & Pacific, the Missouri Pacific, the St. Louis-San Francisco, the St. Louis Southwestern and the Texas & Pacific experienced a decline in both intrastate and interstate passenger traffic as indicated in the accompanying table.

The figures for the state of Kansas apply to the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the Missouri-Kansas-Texas, the Missouri Pacific and the St. Louis-San Francisco. Those for Louisiana show the effect of bus competition upon the Chicago, Rock Island & Pacific, the Atchison, Topeka & Santa Fe, the Southern Pacific, the Missouri Pacific, the St. Louis Southwestern and the Texas & Pacific. The roads in Missouri are the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the Missouri-Kansas-Texas, the Missouri Pacific, the St. Louis-San Francisco and the St. Louis Southwestern. Oklahoma railroads are the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the Missouri-Kansas-Texas, the Missouri Pacific and the St. Louis-San Francisco. Those of Texas are the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the Missouri-Kansas-Texas, the St. Louis-San Francisco, the St. Louis Southwestern, the Southern Pacific and the Texas & Pacific.

The statement showing the trend of passenger revenues, both intrastate and interstate, of Class I roads of the Western district for the years 1922 to 1925, inclusive, demonstrated a similar decrease. The states included in this report were Arizona, Arkansas, California, Colorado, Idaho, Illinois, Iowa, Kansas, Louisiana, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Texas, Utah, Washington, Wisconsin and Wyoming.

The detailed figures of the study which was made are as follows:

Year	Average mileage operated	Passengers carried	Passenger revenue	Pass. rev. per mile of line	Average haul
1922	131,547	273,617,809	$409,628,713	$3,114	47.40
1923	134,638	272,998,308	435,062,569	3,231	51.15
1924	134,852	252,779,522	397,518,897	2,948	51.55
1925	135,257	231,548,682	373,556,489	2,762	54.55

While the number of passengers carried has decreased, there has been an increase in the population, the automobile registration and the number of miles of surfaced road in the Western district during the period from 1914 to 1926. The estimated population in 1914 was 37,642,151, while in 1926 it amounted to 45,340,679, or an increase of 20.45 per cent. The automobile registration totalled 802,114 in 1924 and 9,267,709 in 1926, which is an increase of 1,055.41 per cent. The number of miles of surfaced road totalled 78,595 in 1914 and 184,646 in 1926, an increase of 134.93 per cent.

The trend of passenger traffic during the period of 1914 to 1925 in the states in the Western district including Illinois was downward, while that of the population was upward. The number of passengers carried for the year ending June 30, 1914, totalled 271,829,717, while in 1925 they had decreased to 64.85 per cent, or 176,277,000. The population which totalled 37,642,151 in 1914 had increased 118.60 per cent, or to a total of 44,642,863.

General News Department

The question of repealing the full crew law of Arkansas was submitted to the people with referendum ballot on October 4. With sixty per cent of the ballots counted the vote was 36,500 for repeal and 49,800 against repeal.

The Central Railway Club will hold a meeting at Hotel Statler, Buffalo, on Thursday evening, October 14. William H. Sitterly, general car inspector, Pennsylvania Railroad, will read a paper on operation of passenger trains without the use of angle cocks.

The Union Pacific and the Clerical Employees' Association of the system, have organized a system board of adjustment which will meet every second month to handle disputes arising between the employees and management. The chairman of the board is R. H. Beauchamp, special representative of the vice-president of the Union Pacific.

Fred W. Sargent, president of the Chicago & North Western, was the principal speaker and guest of honor at a banquet of North Western Post, No. 430, American Legion, held at the North Western Terminal in Chicago on September 20. G. B. Vilas, general manager of the North Western, and State Commander Ferre C. Watkins gave brief talks to a group of more than 400 present. This American Legion post is one of two in Illinois whose membership, 211 in this case, has been recruited solely from employees of one railroad. The post, organized in June, 1926, is composed to a great extent of North Western men who served during the World War as Company E, 13th Railway Engineers, and as a part of the Thirty-third, Prairie Division.

New York Railroad Club Meeting

Prof. N. C. Miller, director of the Industrial Extension Division of Rutgers University, will speak on "The Railroad and Its Training Problem" at the meeting of the New York Railroad Club on Friday, October 15. The technical program will be preceded and followed with numbers by the Long Island Trainmen's Trio. The meeting will be called to order at eight o'clock in the large auditorium of the Engineering Societies Building, 29 West 39th street, New York.

Floods Damage Railroads in Illinois

Railroads in central and western Illinois suffered property damage and some interruption to service on October 2, 3, 4, and 5, for the second time within a month, when the Illinois river and its tributaries rose above their banks and levees and inundated the surrounding country. The Chicago & North Western suspended operation on its line from Peoria, Ill., to Benld from October 5 to October 7, when two bents of the bridge over Salt Creek were washed out. Between Hannibal, Mo., and Decatur, Ill., overflowing streams washed out or undermined the piers of three bridges on the Wabash, making complete rebuilding necessary. Temporary delays were occasioned on the Wabash at Monticello, Ill., and Riverton on October 3 and 4, by water two feet deep over the rails and at Naples where about 400 ft. of track was washed out around the station. North of Decatur minor washouts made it necessary to route trains over the Illinois Central. A bridge on the Wabash over the Sangamon river near Riverton was kept from being washed away by placing loaded coal cars on it. Short stretches of roadbed were endangered on the Illinois Central between Springfield, Ill., and Mt. Pulaski and between Mt. Pulaski and Lincoln on October 4. The Illinois river forced the Chicago, Burlington & Quincy to route its trains between Concord, Ill., and Jacksonville over the Chicago & Alton for four days. Water rose above the level of the tracks of the Chicago & Alton at Mason City, Ill., on October 5 and at Hillview, Ill., on October 3, temporarily delaying all trains.

R. B. A. Annual Meeting

The Railway Business Association will hold its annual meeting and dinner at the Hotel Commodore, New York City, Thursday, November 18, 1926. The first business session will be held at 10:00 a.m. to receive reports of the officers and standing committees and for a discussion of "The Supply Industry and Future Railway Progress." Luncheon will be held at 12:30 p.m. and the meeting will reconvene at 1:00 p.m. for a second business session. Reports of convention committees will be received and election of officers will be held.

The dinner will start at 7:00 p.m., the speakers being Whiteford R. Cole, president of the Louisville & Nashville, and United States Senator Simeon D. Fess of Ohio.

Railway Treasury Officers' Association

At the annual meeting of the Railway Treasury Officers' Association held at White Sulphur Springs, W. Va., September 23 and 24 the following executive committee was elected: President, Carl Nyquist, vice-president, secretary and treasurer, Chicago, Rock Island & Pacific, Chicago; vice-president, Maury Middleton, treasurer, Southern, Washington, D. C.; 2nd vice-president, O. M. Longnecker, treasurer, Southern Pacific Lines in Texas, Houston, Tex.; H. P. Conner, assistant treasurer, Pennsylvania, Philadelphia, Pa.; R. N. Harry, assistant general treasurer, New York Central, New York; F. L. Koentz, secretary and treasurer, Elgin, Joliet & Eastern, Chicago; John T. Reid, treasurer, Atlantic Coast Line, Wilmington, N. C.; A. T. Williams, assistant treasurer, Chicago, Burlington & Quincy, Chicago; J. A. Yates, general treasurer, Canadian National, Montreal, Can.

New York Central Wins Baseball Championship

The second annual contest between the New York Central and the Pennsylvania for the world's railroad baseball championship was held at American Association Park, Indianapolis, Ind., on Saturday, October 2, and was witnessed by a crowd of nearly 11,000 people, composed largely of employees and officers of the two roads. The winner was the Indiana Harbor Belt team, which defeated the Columbus division team of the Pennsylvania by a score of three to one. One year ago at Rochester, N. Y., the Pennsylvania was the winner. The Pennsylvania champion that year was the Philadelphia Terminal team, which was this year succeeded by the Columbus division team. The I. H. B. team represented the New York Central in both years.

Music was furnished by the Altoona Works Band and the Big Four Band of Indianapolis. In the evening a dinner was given at the Claypool Hotel by Messrs. Crowley and Atterbury, presidents of the roads, at which Governor Jackson and Mayor Duvall were among the speakers. Trophies were presented to the champions and the runner-up teams of both roads. The runners-up for the New York Central were from the Avis shops and those for the Pennsylvania from the Altoona shops. T. W. Hulme, vice-president of the Pennsylvania, representing the two roads jointly, also gave individual gifts to each member of the championship teams; a traveling bag to each. Gifts were given also to the members of the runner-up teams. Athletic associations of the two roads also joined in giving a silver cup to the Indiana Harbor Belt team.

The Coder System

The installation of automatic train control, with other signaling improvements, on the Pennsylvania Railroad was the subject of a short article in the *Railway Age* of September 18, page 525, wherein reference was made to experiments with a modification of the continuous automatic train control system which has been installed on that road by the Union Switch & Signal Company. This modified arrangement includes the "coder system," so called.

In this system the circuit by which impulses originating on

the roadway are made to convey impulses to apparatus on the locomotive actuating the air brake system, is operated or controlled by a device working on a principle similar to that of the well-known selector, which is used in telephone train dispatching; apparatus by which the sending end produces effects at the receiving end by varied arrangements of impulses; or, in telegraph parlance, different combinations of dots or dashes, or dots and dashes.

Immediately on the opening of a switch in, or entrance of a train on to, any given track circuit the signal track current, governing the visual wayside signals, is practically de-energized and a 100-cycle alternating current, interrupted by a code transmitter, is substituted in the rail. This current is interrupted at definite rates (coded) in accordance with the condition of the signals and track circuits ahead. A similar current is induced in the receiving or pickup coils on the locomotive, which current, after being amplified in turn operates the apparatus which translates the varying rates of impulse into the indication which it is desired to display to the engineman; and by additional apparatus can be made to operate a whistle and to perform suitable functions related to an acknowledger, and a forestaller. Provision is made for one, two, three or four stages of speed control.

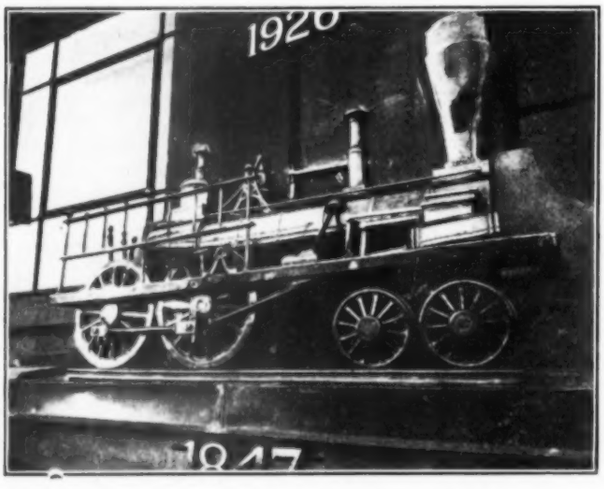
The absence of current, or a continuous current either a.c. or d.c., results in the display of a cab signal indicating slow speed.

A predetermined number of impulses causes the display of the approach signal, requiring the train to reduce speed and approach the next signal prepared to stop. A second code, giving a greater number of interruptions per minute causes the display of the approach restricting signal, requiring the train to pass next signal at restricted speed (usually 30 miles an hour). A third code, having a still greater number of impulses causes a display of the clear signal.

As the train leaves the circuit, the coded currents are cut off and the signal track circuit is restored.

A Locomotive of 1848

The bronze model of a locomotive which for 75 years has surmounted the clock on the granite passenger station of the Fitchburg Railroad on Causeway street, Boston, has been taken down and polished and installed over the entrance to the new general office building of the Boston & Maine.



The Fitchburg is now a part of the Boston & Maine, and its old station, which stands just east of the present North station, is now used for other purposes.

The model is about 5 ft. long and is believed to be a fair representation of the "Alvah Crocker," one of the early locomotives of the Fitchburg road. It had stood on the "castle" at Causeway street since May 26, 1848, which was the year in which the building was finished.

The bill of sale, which has lately been brought to light, shows that the model was made at the foundry of H. N. Hooper & Co., Boston, and that another miniature locomotive was made at the same time. The bill bears the signature of S. M. Felton, then superintendent of the Fitchburg Railroad, who was later president of the Philadelphia, Wilmington & Baltimore, and was the father of S. M. Felton, of Chicago, chairman of the board of the Chicago Great Western.

Net for August 5.51 Per Cent

Class I railroads in August had a net railway operating income of $133,008,268, which was at the annual rate of return of 5.51 per cent on their property investment, according to reports of the carriers as compiled by the Bureau of Railway Economics. In August last year the net railway operating income was $124,943,508, or at the rate of 5.29 per cent on the property investment.

Operating revenues increased 4.2 per cent and operating expenses 2.7 per cent. Taxes showed an increase of $3,708,082 or 11.4 per cent, and for the first eight months the taxes this year totaled $253,420,511, an increase of $21,097,107 or 9.1 per cent above that of the corresponding period last year.

Fourteen Class I railroads operated at a loss in August, of which six were in the Eastern district, one in the Southern, and seven in the Western district.

Operating revenues for the first eight months showed an increase of 4.8 per cent, and operating expenses an increase of 2.8 per cent.

Net for the Class I railroads in the Eastern district for eight months totaled $389,093,089; annual rate 5.69 per cent; last year $352,759,444; annual rate 5.27 per cent. Operating revenues for the eight months $2,096,277,120; increase 4.7 per cent; operating expenses $1,554,993,333; increase 3.0 per cent. Net for August $65,758,597, compared with $64,701,975 in August, 1925.

Class I railroads in the Southern district for the first eight months had net $105,483,057; annual rate 5.77 per cent; last year, $102,550,493; annual rate 5.88 per cent. Operating revenues for eight months $581,799,383; increase 7 per cent; operating expenses $431,083,624; increase 7.1 per cent. For August net amounted to $12,943,409; last year, $15,105,873.

Class I railroads in the Western district for the first eight months had net $250,368,023; annual rate 4.28 per cent; last year, $208,817,621; annual rate 3.63 per cent. Operating revenues $1,485,486,105, an increase of 4 per cent; operating expenses $1,108,053,679; increase eight-tenths of one per cent. For August net operating income $54,306,262; last year $45,135,660. The summary for the roads as a whole follows:

CLASS I ROADS—UNITED STATES

	1926	1925
Month of August		
Total operating revenues	$578,822,690	$555,493,701
Total operating expenses	399,329,821	388,898,354
Taxes	36,373,380	32,665,298
Net railway operating income	133,008,268	124,943,508
Operating ratios	68.99	70.01
Rate of return on property investmeent, per cent	5.51	5.29
Eight months ended August 31st		
Total operating revenues	$4,163,562,608	$3,974,000.198
Total operating expenses	3,094,130,636	3,011,196,508
Taxes	253,420,511	232,323,404
Net railway operating income	744,944,169	664,127,558
Operating ratios	74.31	75.77
Rate of return on property investment, per cent	5.13	4.68

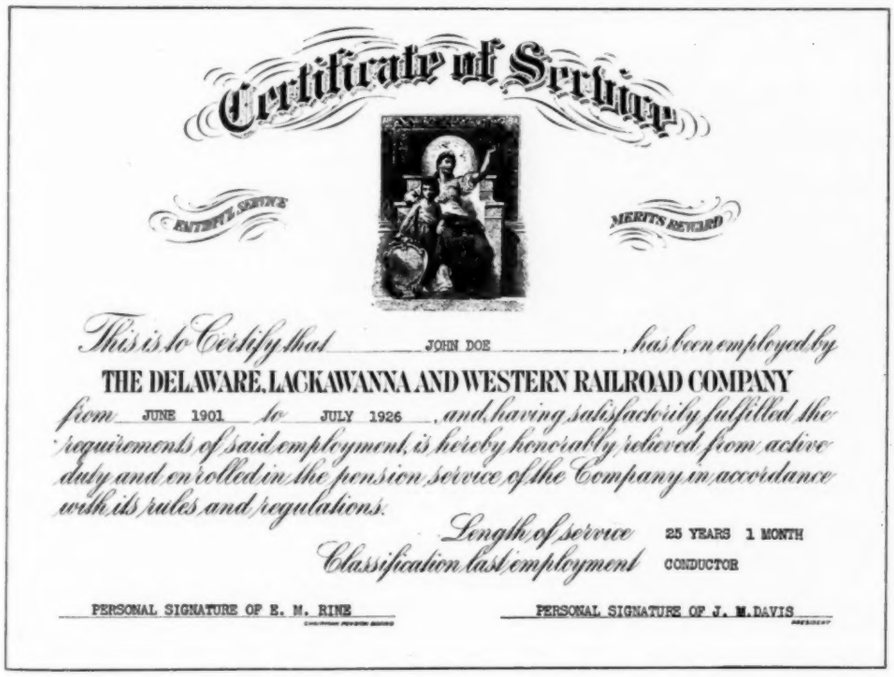
Space Assigned for Railway Appliances Exhibit

The board of directors of the National Railway Appliances Association has assigned space for the annual exhibit of the association to be held in the Coliseum, Chicago, on March 7-10, 1927, to 160 companies. The exhibition will be held at the time of the 28th annual convention of the American Railway Engineering Association.

The names of the companies assigned space, as recorded by the secretary, C. W. Kelly, 825 South Wabash avenue, Chicago, are as follows:

A. C. Spark Plug Co., Flint, Mich.
Adams Motor and Mfg. Co., Chicago.
Adams and Westlake Company, Chicago.
Air Reduction Sales Company, New York.
American Cable Company, New York.
American Car and Foundry Company, New York.
American Casting Company, Birmingham, Ala.
American Chain Company, Inc., Bridgeport, Conn.
American Fork and Hoe Company, Cleveland, Ohio.
American Hoist and Derrick Co., St. Paul, Minn.
American Steel and Wire Company, Chicago.
American Valve and Meter Co., Cincinnati, Ohio.
Ames Shovel and Tool Company, Boston, Mass.
Anchor Company, Milwaukee, Wisc.
Armco Culvert and Flume Manufacturers' Association, Middletown, Ohio.
Baker-Raulang Company, Cleveland, Ohio.

Balkwill Manganese Crossing Co., Cleveland, Ohio.
Barber Asphalt Company, Philadelphia, Pa.
Barrett Company, New York.
Bethlehem Steel Company, Bethlehem, Pa.
Blaw-Knox Company, Pittsburgh, Pa.
Brach Manufacturing Co., L. S., Newark, N. J.
Brown Rail Loader Company, Boston, Mass.
Buda Company, Harvey, Ill.
Carbic Manufacturing Company, Duluth, Minn.
Carey Company, Philip, Cincinnati, Ohio.
Carnegie Steel Company, Pittsburgh, Pa.
Carter Bloxonend Flooring Company, Kansas City, Mo.
Celotex Company, Chicago.
Central Electric Company, Chicago.
Chicago Bridge and Iron Works, Chicago.
Chicago Malleable Castings Co., Chicago.
Chicago Railway Signal and Supply Co., Chicago.
Chipman Chemical Engineering Co., Bound Brook, N. J.
Clark Car Company, Pittsburgh, Pa.
Cleveland Frog and Crossing Co., Cleveland, Ohio.
Cleveland Pneumatic Tool Co., Cleveland, Ohio.
Cleveland Railway Supply Co., Cleveland, Ohio.
Copperweld Steel Company, Rankin, Pa.
Crerar, Adams & Co., Chicago.
Creepcheck Co., Inc., Hoboken, N. Y.
Cullen-Friestedt Company, Chicago.
Dearborn Chemical Company, Chicago.
Detroit Graphite Company, Chicago.
Dickey Clay Mfg. Co., W. S., Kansas City, Mo.
Dickinson, Inc., Paul, Chicago.
Dilworth, Porter & Co., Inc., Pittsburgh, Pa.
Duff Manufacturing Company, Pittsburgh, Pa.
Edison, Inc., Thomas A., Bloomfield, N. J.
Edison Storage Battery Co., Orange, N. J.
Electric Storage Battery Co., Philadelphia, Pa.
Electric Tamper and Equipment Co., Chicago.
Elwell Parker Electric Co., Cleveland, Ohio
Euclid Electric and Manufacturing Co., Euclid, Ohio.
Fairbanks, Morse & Co., Chicago.
Fairmont Railway Motors, Inc., Fairmont, Minn.
Fleming Company, Scranton, Pa.
Frog Switch and Mfg. Co., Carlisle, Pa.
General Electric Company, Schenectady, N. Y.
General Railway Signal Co., Rochester, N. Y.
Handlan-Buck Manufacturing Company, St. Louis, Mo.
Hayes Track Appliance Co., Richmond, Ind.
Hazard Manufacturing Co., Wilkes-Barre, Pa.
Headley Good Roads Co., Philadelphia, Pa.
Hubbard and Company, Pittsburgh, Pa.
Illinois Steel Company, Chicago.
Ingersoll-Rand Company, New York.
Jaeger Machine Company, Columbus, Ohio.
Johns-Manville, Inc., New York.
Jordan Co., O. F., East Chicago Ind.
Kalamazoo Railway Supply Co., Kalamazoo, Mich.
Kelly-Derby Co., Inc., Chicago.
Kentucky Rock Asphalt Company, Inc., Louisville, Ky.
Kerite Insulated Wire and Cable Co., Inc., New York.
Keystone Grinder and Manufacturing Co., Pittsburgh, Pa.
Keystone Steel and Wire Co., Peoria, Ill.
Koppel Industrial Car and Equipment Co., Pittsburgh, Pa.
Lehon Company, Chicago.
Locomotive Finished Material Co., Atchison, Kans.
Lorain Steel Company, Johnstown, Pa.
Louisville Frog and Switch Co., Louisville, Ky.
Lufkin Rule Co., Saginaw, Mich.
Lundie Engineering Corporation, New York.
Lundy Company, E. A., Pittsburgh, Pa.
MacLean-Fogg Lock Nut Company, Inc., Chicago.
MacRae's Blue Book Co., Chicago.
McGraw-Hill Co., New York.
Magnetic Signal Company, Los Angeles, Cal.
Maintenance Equipment Co., Chicago.
Massey Concrete Products Corporation, Chicago.
Mechanical Manufacturing Co., Chicago.
Metal and Thermit Corporation, New York.
Miller Train Control Corporation, Danville, Ill.
Morden Frog and Crossing Works, Chicago.
Moss Tie Company, T. J., St. Louis, Mo.
Mudge & Company, Chicago.
Murdock Mfg. and Supply Co., Cincinnati, Ohio.
National Boiler Washing Co. of Illinois, Chicago.
National Carbon Co., Inc., Cleveland, Ohio.
National Lead Co., New York.
National Lock Washer Co., Newark, N. J.
National Safety Appliance Co., San Francisco, Calif.
National Vulcanized Fibre Co., Pittsburgh, Pa.
Nelson Manufacturing Co., B. F., Minneapolis, Minn.
Nichols and Bros., George P., Chicago.
Northwestern Motor Company, Eau Claire, Wis.
Ogle Construction Co., Chicago.
Ohio Brass Company, Mansfield, Ohio.
Ohio Valley Rock Asphalt Company, Louisville, Ky.
Okonite Company, Passaic, N. J.
Okonite-Callender Cable Company, Passaic, N. J.
Oxweld Railroad Service Company, Chicago.
Page Steel and Wire Company, Bridgeport, Conn.
Patterson Co., W. W., Pittsburgh, Pa.
Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.
Pocket List of Railroad Officials, New York.
P & M Co., Chicago.
Positive Rail Anchor Co., Marion, Ind.
Pyle-National Company, Chicago.
Q & C Co., New York.
Racine Tool and Machine Company, Racine, Wis.
Railway Maintenance Corporation, Pittsburgh, Pa.
Rail Joint Company, Chicago.
Railroad Accessories Corp., New York.
Railroad Supply Company, Chicago.
Railway Purchases and Stores, Chicago.
Railway Review, Chicago.
Ramapo Ajax Corporation, New York.
Rawls Machine and Manufacturing Works, Chicago.
Reade Manufacturing Company, Jersey City, N. J.
Reliance Manufacturing Company, Massillon, Ohio.
Richards-Wilcox Manufacturing Co., Aurora, Ill.
Roberts Co., George J., Dayton, Ohio.
Roberts and Schaefer Company, Chicago.
Robertson and Co., Wm., Chicago.
Robertson and Company, H. H., Pittsburgh, Pa.
Sellers Manufacturing Company, Chicago.
Signal Accessories Corporation, Utica, N. Y.
Simmons-Boardman Publishing Company, New York.
Sivyer Steel Casting Co., Milwaukee, Wis.
Skelton Shovel Co., Dunkirk, N. Y.
Snow Construction Co., T. W., Chicago.
Southern Signal Co., Louisville Ky.
Sullivan Machinery Company, Chicago.
Templeton, Kenly Co., Ltd., Chicago.
Torchweld Equipment Company, Chicago.
Union Switch and Signal Co., Swissvale, Pa.
U. S. Wind Engine and Pump Co., Batavia, Ill.
Verona Tool Works, Pittsburgh, Pa.
Ward Leonard Electric Company, Mt. Vernon, N. Y.
Warren Tool and Forge Co., Warren, Ohio.
Waterbury Battery Company, New York.
Weir Kilby Corporation, Cincinnati, Ohio.
Western Wheeled Scraper Co., Aurora, Ill.
Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.
Weston Electrical Instrument Corporation, Newark, N. J.
Wharton, Jr., and Co., Inc., Wm., Easton, Pa.
Wood Conversion Co., Cloquet, Minn.
Woolery Machine Company, Minneapolis, Minn.
Wyoming Shovel Works, Wyoming, Pa.


Certificate of Service
ENTIRE LOYALTY
MERITS REWARD
This is to Certify that JOHN DOE has been employed by
THE DELAWARE, LACKAWANNA AND WESTERN RAILROAD COMPANY
from JUNE 1901 to JULY 1926 , and having satisfactorily fulfilled the requirements of said employment, is hereby honorably relieved from active duty and enrolled in the pension service of the Company in accordance with its rules and regulations.
Length of service 25 YEARS 1 MONTH
Classification last employment CONDUCTOR
PERSONAL SIGNATURE OF E. M. RINE
PERSONAL SIGNATURE OF J. M. DAVIS

Lackawanna Pensioner's Certificate

The accompanying illustration is a copy, reduced in size, of an engraved certificate, 12 in. by 10 in., which has been adopted by the Delaware, Lackawanna & Western, as a form to be used in conveying to each pensioned employee the appreciation of the company, to be delivered on the day that he retires. Each certificate is to be signed by the president of the road and by the chairman of the pension board.

The number of retired employees now on the pension roll of the Lackawanna is about 600.

The recipients of these certificates are reported as being very proud of them—which goes without saying.

Traffic News

Sleeping car service has been established between Dallas, Texas, and Atlanta, Ga. Cars leave Dallas at 10:20 p. m. and the route is over the Texas & Pacific to Shreveport, La., thence over the Yazoo & Mississippi Valley to Meridian, Miss.; the Alabama Great Southern to Birmingham, Ala., and thence over the Southern to Atlanta where the cars arrive at 6:05 the second morning. On the return trip cars leave Atlanta at 11:30 p. m. and arrive at Dallas at 7:45 a. m. the second morning.

Minerals Along the C. N. R.

The mineral resources along the lines of the Canadian National Railway in northeastern Canada are the subject of a voluminous handbook which has been issued by the Development Department of the railway, Toronto; a pamphlet of 80 pages, 12 in. wide and 9½ in. high, containing 20 or more folder maps showing in great detail the different important mineral regions of that part of the Dominion. The railway company is ready and anxious to give all possible information about mining and the mineral industries to all persons interested, and the pamphlet contains a great mass of facts about gold, silver, nickel, copper, lead, zinc and other products of the earth. Besides the maps, the book is illustrated by half-tone engravings of industrial centers.

Southwest Shippers' Advisory Board Meeting

The attendance at the Southwest Shippers' Advisory Board meeting held at Dallas, Texas, on September 23, was greater than at any previous meeting. Shipping interests and representatives of railroad commissions in the territory expressed satisfaction with the successful handling of the extremely heavy grain movement this season, which greatly exceeded in volume and rapidity any previous movement experienced in the territory. Reports of the various commodity committees indicated a substantial increase in the business of most industries for the remainder of the year except that decreases are looked for in sugar cane, livestock and lumber as compared with last year. The government bureau cotton estimate indicates a substantial increase in production in the territory in spite of excessive ravages of cotton pests and adverse weather conditions at the critical period in the crop's progress. The next meeting of the board in February will be held at San Antonio, Texas.

Trans-Missouri-Kansas Shippers' Advisory Board Meeting

Over 200 shippers and railroad representatives attended the meeting of the Trans-Missouri-Kansas Shippers' Advisory Board held at St. Joseph, Mo., on September 15. A total of 120 new applications for membership in the board were approved, which makes the present membership approximately 800. The cement industry reported a slight depression in business generally, the report for August reflecting a decrease of 21 per cent in production within the Eastern district over the same month last year and about 7½ per cent in the Western district while shipments in the Eastern district were 3.26 per cent less and in the Western district 1.26 per cent less. The clay products section reported an increase in business for the last quarter, ranging from 5 to 20 per cent over last year and estimated the requirements for the next three months at 11,850 box and 2,857 open cars. The coal and coke industry reported an increase in movements for the last quarter of from 10 per cent to 12 per cent over last year. The movement of livestock in the western and southwestern sections has been comparatively light in the past seven months, with the exception of sheep, which have shown a moderate increase. All records were broken in the amount of grain offered and the loading of cars this season. The movement was handled in a satisfactory manner by the railroads without serious congestion and with but temporary car shortages. The next meeting of the board will be held in Kansas City, Mo., on December 15, at which time the officers for the year 1927 will be elected.

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has issued a decision on the complaint filed by the Indiana State Chamber of Commerce finding that rates on bituminous coal, in carloads, from Ohio and the "inner crescent" to points in Indiana are not unreasonable or unduly prejudicial.

Grain Rate Reduction Brief Filed

A brief, summarizing the evidence submitted in support of the proposed 6 per cent reduction in eastbound grain and flour rates as proposed by the Minneapolis & St. Louis and the Minneapolis, St. Paul & Sault Ste. Marie, has been filed with the commission by the state of Minnesota. In the summary it is contended that the proposed reduction would work a benefit to agricultural, mining and grain marketing interests, not only in Minnesota but through the entire northwest. Other briefs must be filed before December 1.

Freight Rates to Gulf Ports

The Interstate Commerce Commission has made public a proposed report by Examiner Irving L. Koch recommending findings to be made by the commission in a series of freight rate cases involving the relation of rates on petroleum and products, grain and grain products and certain other commodities via Galveston (and other Texas ports taking the same rates) as against those via New Orleans and other Louisiana ports. On petroleum and products the examiner recommends that the commission reverse a former decision which established port differentials in favor of Galveston from points in northern Texas, central Oklahoma and southern Kansas and that the rates to Texas and Louisiana ports be made the same. As to grain and products he recommends that the commission modify its former differential adjustment by reducing the differential in favor of Galveston by one cent per hundred pounds.

State Commissions

The Public Service Commission of New York announces that 32 additional highway crossings have been added to its program looking to the changing of grades; 13 in the city of Albany, three in Mt. Kisco, and the others in various sections of the state. The commission has recently taken off from its list the proposals for a number of crossings where, because of unwillingness of local authorities, it was impracticable to proceed.

Grade Crossings in New York

The Public Service Commission of New York announces this week that its proposals for the elimination of highway grade crossings of railroads have had to be suspended in 28 different projects because of the unwillingness of the city, town or village to pay the required 25 per cent of the cost, this 25 per cent being in most or all cases a greater sum than that named in the law beyond which municipalities are not required to go. The eliminations thus far ordered by the commission under the twenty-million-dollar appropriation will cost an estimated sum of $2,450,400 which is calculated to cover 14 crossings.

Court News

Tie Tongs Simple Tools; Employee Assumes Risk

The Kentucky Court of Appeals holds that a railroad is not liable for injuries to a trackman while using tie tongs the points of which were not sharp enough to grip the ties safely, such tongs being simple tools the employer is not required to inspect, and the risk of using which the employee assumes.—Blacksby v. L. & N. (Ky.), 280 S. W. 1093.

Assumption of Risk of Known Conditions in Yard

The Kentucky Court of Appeals holds that a yardmaster, killed by falling over the pier of a bridge in the yard on a foggy night, assumed the risk of an insufficient guard at the bridge, the condition of which he knew.—Moore v. C. & O. (Ky.), 280 S. W. 482.

Railroad Not Liable for Threats of Employee

The Kentucky Court of Appeals holds that a railroad is not liable for the conduct of a freight yard clerk who uses abusive language and threats in relation to a personal matter against a prospective passenger on the station platform.—L. & N. v. Lindsay (Ky.), 279 S. W. 965.

Excessive Assessment of Railroad Property

The Mississippi Supreme Court holds that an order of the State Tax Commission, assessing the property of a railroad company for municipal taxation at a higher value than it assessed the same property of the company for state and county taxation, is void.—City of Hattiesburg v. N. O. & N. E. (Miss.), 106 So. 749.

May Sue Shipper or Consignee for Undercharge

The Mississippi Supreme Court holds that a railroad which makes a mistake in collecting its tariff charges has the option to sue either the shipper or the consignee for the difference, unless it has contracted with the shipper not to collect from consignee.—Gulf, M. & N. v. Riverside Brick & Mfg. Co. (Miss.), 107 So. 193.

Standing Box Car Not an Attractive Nuisance

The Kentucky Court of Appeals holds that a standing freight car is not a dangerous piece of machinery bringing it within the attractive nuisance class which a railroad is required to guard against trespassing children, and it is not liable for injuries to a boy who fell from the top of a box car.—Smith v. Hines (Ky.), 278 S. W. 142.

Railroad Not Liable as Insurer

The Mississippi Supreme Court holds that cotton being accumulated on a station platform by the owner with the station agent's consent until there is enough for a carload is not so delivered and accepted as to make the railroad liable as an insurer for its destruction by fire.—Adair v. Yazoo & M. V. (Miss.), 107 So. 371.

Automatic Couplers Under Safety Appliance Act

The Circuit Court of Appeals, Sixth Circuit, holds that an employee may recover for an injury sustained through failure to equip a car with automatic couplers as required by the Safety Appliance Act although neither he nor the car was at the time engaged in interstate commerce.—Detroit United Ry. v. Craven, 13 F. (2d) 352.

Adequacy of Car Service a Question for I. C. C.

The Kentucky Court of Appeals holds that, under the Transportation Act, the adequacy of car service is a matter for the Interstate Commerce Commission in the first instance, at least in interstate shipments, and a state court has no jurisdiction of an action based on alleged inadequacy, until the commission acts.—Gardner v. L. & N. (Ky.), 279 S. W. 947.

View of Track Temporarily Obstructed—Traveler's Duty

The West Virginia Supreme Court of Appeals holds that if a train passing on one track temporarily obstructs the view of the next track at a crossing, it is the duty of one desiring to cross to wait until the temporary obstruction has disappeared; and he is not relieved from this duty by the railroad's failure to give crossing signals.—Gray v. N. & W. (W. Va.), 130 S. E. 139.

Foreign Railway News

Victorian Plans Highway Freight Service in Australia

Highway freight service by motor truck from Melbourne to several country districts will be inaugurated in Australia by the Victorian to meet the competition of private transport services in country districts.

Persia to Have New Railroad

Persia is to have a new railroad from Teheran to the Persian Gulf, according to a dispatch from Geneva, Switzerland, to the New York Times. The estimated cost of construction is $35,000,000, which will be advanced by New York and London banks. A commission of American, English and Swiss engineers left Geneva on September 25, en route to Persia to study the country through which the railroad will be built. No information was given as to the time when construction of the new road will commence.

French Railroad Merger Under Consideration

A plan is being studied by the Ministry of Public Works of France wherein is proposed the union of the Paris-Orleans and the Midi. Although these railroads are privately owned, they have various financial relationships with the government. It is understood that under the proposed plans, the merger will not be wholly complete, but will allow each railroad to retain individual features for which it is noted. In all probabilities, a single board of directors will be appointed, and a general staff organized for the two roads, in accordance with an economy program. Should the proposed merger take place, it will bring together two French roads which are well advanced in electrification. The Midi, which has been making rapid progress in electrifying its lines in the regions north of the Pyrenees, operates in a district where tremendous water power is available. The Paris-Orleans is also well advanced in electrification. It is understood that the present ministry will pursue the course of former ministries in using German reparations materials in the general movement for electrification of the French railroads.

Condition of Railways in the Belgian Congo

Although improvements involving the alignment of track and the reduction of grades have increased the carrying capacity of the railroad between the ports of Matadi and Stanley Pool by 120,000 tons a year in each direction, hauling to and from the interior of the Belgian Congo still continues to be greatly restricted, according to a report in the Railway Gazette. The increase is insufficient for the volume of freight, both import and export, offered to the railway. A proposal has been made to construct seven locks in the cataract section of the Congo, thereby enabling ocean steamers to unload at Stanley Pool instead of Matadi, as is done at present, and to eventually abandon the railroad. The proposal is based on the assumption that the railway from Matadi to Stanley Pool will never be able to meet the traffic demand because of adverse operating conditions. Progress is being made in the construction of a 625-mile railway from Bukama to Ilebo, but is restricted at Ilebo, because of the difficulty in securing materials from Matadi. The line, which will probably be completed in 1928, will enable passengers to travel from Cape Town to the Lower Kasai district, without changing. A final survey has been completed for a railway to be constructed from Stanleyville, to the Kilo-Moto gold districts.

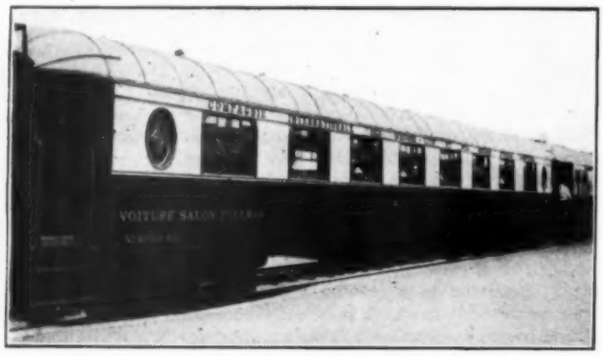
Colombian Railroad Extension Program

A bill calling for the construction of approximately 722 miles of railway within the next four years in Colombia has been submitted to the Colombian Congress by the Colombian government, according to the Railway Gazette. The projected construction is mostly work in extending the various railroads now

in operation. Included in the proposed construction are the completion of the Northern, the completion of the Tolima as far as Neiva, the extension of the Pacific from Ibague to Armenia, and of the Caldas from Nacederos to Armenia. It also includes the proposed extension of the Pacific to Pasto and of the Antioquia from Bolombolo to Cartagena, and the completion through Tunja and Moniquira of the Carare and of the Cucuta Pamplona. In addition, the bill proposes the extension of the Narino from Tumaco to Piedraccas on the Pasto motor road. It is also proposed that the government acquire the Santamarta, at present a private concern, and extend it. In the same bill the government seeks authorization to raise a loan of £20,000,000, which will be entirely devoted to the proposed railroad extensions and other transportation improvements. The bill also calls for the election of a railway and transport board to advise the Ministry of Public Works in the plans and construction of the improvements.

The "Golden Arrow" Express

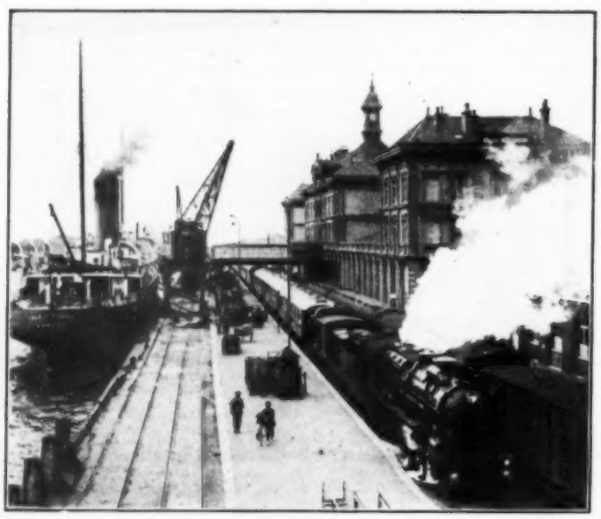
The Northern Railway of France in conjunction with the International Sleeping Car Company has placed in service a new train composed entirely of English Pullman cars on the run between Paris and Calais, connecting with English channel boats. The train is known as the Golden Arrow Express. It is scheduled to make the trip of 185.2 miles at a speed of about 60 miles per hour,



Wide World Photo

One of the Cars of the Golden Arrow Express

being a considerable improvement over any existing service. The train is made up of 10 all-steel Pullman chair cars and a baggage car. The Pullman cars are arranged in pairs, every other car being provided with a kitchen to supply food for passengers of two cars. The cars with kitchens seat 26 and those without kitchens 34. Chairs in the cars are arranged in pairs with a table between, so that all passengers who so desire can be served with food without leaving their places.



Wide World Photo

The Golden Arrow Express Leaving Calais Marine Station

The cars are painted amber and cream with varied decorative effects on each pair in red, blue or green. The train weighs 563 tons and is hauled by a Pacific type locomotive.

In addition to the advantages for the traveler in the greater speed and the ease of securing meals, the management has arranged with the French customs authorities to examine hand baggage en route rather than at Calais as has been the custom in the past. An extra fare of approximately $3.35 is charged. Two identical trains are being operated in the service.

British Railway Statistics Show Effect of Coal Strike

Statistics for June, 1926, issued by the minister of transport of Great Britain, show a decrease in freight and passenger traffic on British railways, in comparison with figures for June, 1925. The decrease is attributed to the effect of the strike of British coal miners. The total number of passenger journeys (excluding season ticket holders) totaled 73,556,015, a decrease of 34,908,367 journeys, or 32.2 per cent, in comparison with the total passenger journeys of June, 1925. The receipts from passengers (excluding season ticket holders) show a decrease of £1,838,780, or 29.3 per cent. If the London tubes and the Metropolitan District railway are omitted, the figures show a decrease in journeys of 34,412,893, or 38.5 per cent, and a decrease in receipts of £1,822,853, or 30.3 per cent. For all railways, the revenue from passenger traffic was £1,967,635 less than June, 1925, a decrease of 23.6 per cent. Passenger train-miles showed a decrease of 8,561,511 miles, or 38.3 per cent. The total tonnage of freight carried (excluding that which was hauled free) was 10,210,565 tons, a decrease of 13,838,770 tons, or 57.5 per cent. The total ton-miles (excluding free hauled) were 45.4 per cent less than in June, 1925. Freight revenue (less the cost of collection and delivery) amounted to £5,332,201, a decrease of £2,653,571, or 33.2 per cent. Freight train miles run were 4,119,777, less than in June, 1925, a decrease of 37.4 per cent.

New System of Management for Rhodesian Railways

The Rhodesian Railways are to have a new system of management, according to a report published recently in the Times (London). The object of the new system is to operate the railways serving Northern Rhodesia, Southern Rhodesia, the Bechuanaland Protectorate, the Mozambique territory, and 112 miles of railway in the Union of South Africa (from Ramathlabama to Vryburg) as a single transportation system. It is understood that representatives of the British South Africa Company concur as to the new system of management, and will endeavor to continue the existing arrangements, or make new arrangements toward this end, with the Beira Railway Company and the Beira Junction Railway Company to facilitate unified administration. An authority, to be called the Railway Commission, is to be set up, composed of three members, one appointed by the government of Northern Rhodesia, one by the government of Southern Rhodesia, and one by the Bechuanaland Protectorate. A chairman will also be appointed jointly by the governments after consultation with the railway company. Each of the governments is to take steps to pass legislation providing that all rates shall be subject to the approval of the railway commission. Because of the delay faced in getting the new system of management under way, the plan will not go into effect until October 1, 1927. For the intervening period, it is arranged that the companies will limit their dividend distribution for each of the two years ending September 30, 1926, and September 30, 1927, to £150,000. The surplus revenue for the two years will be used to form part of the reserve.

Miscellaneous

A loan of 60,000,000 Swiss francs for the use of the French State Railways in bonds of 1,000 Swiss francs each, has been authorized by the government of Switzerland. The bonds will be issued in Switzerland, in accordance with the conditions specified in the contract passed on August 19, 1926, with the Banque du Credit Suisse at Zurich. The nominal interest rate will be 7 per cent and the bonds will be amortizable during a period beginning April 1, 1927, to finish at the latest on October 1, 1951.

Equipment and Supplies

Locomotives

THE NEW YORK, CHICAGO & ST. LOUIS is inquiring for four Pacific type locomotives.

THE PENNSYLVANIA is placing orders for the electrical equipment for eight new electric locomotives.

THE MANILLA RAILROAD has ordered three, three-cylinder Pacific type locomotives from the Baldwin Locomotive Works.

THE SOUTHERN PACIFIC is expected to enter the market for three Pacific type and ten 4-10-2 type locomotives.

THE LOUISVILLE & NASHVILLE reported in the *Railway Age* of October 2 as having authorized the purchase of 18 Mikado type locomotives is now inquiring for this equipment.

Freight Cars

THE LONG ISLAND is inquiring for five caboose cars.

THE PACIFIC FRUIT EXPRESS is inquiring for 500 underframes.

THE MISSOURI PACIFIC will soon enter the market for a number of freight cars.

THE MISSOURI-KANSAS-TEXAS contemplates building 500 freight cars in its own shops.

THE SOUTHERN PACIFIC will build 500 fifty-ton single sheathed box cars in its own shops.

THE BUFFALO, ROCHESTER & PITTSBURGH is reported as asking for bids on repairs to 500 steel coal cars.

THE CITY SERVICE TANK LINE COMPANY has ordered 30 insulated tank cars from the American Car & Foundry Company.

THE EMPIRE REFINERIES, INC., have ordered 30 class 4 tank cars of 8,000-gal. capacity from the General American Tank Car Corporation.

THE CHICAGO & NORTH WESTERN has ordered 500 stock car bodies from the Illinois Car & Manufacturing Company in addition to the 500 ordered in June.

THE GREAT NORTHERN is expected to place orders this week for 500 underframes. Inquiry for these underframes was reported in the *Railway Age* of September 18.

THE PALACE POULTRY CAR COMPANY has ordered 100 poultry cars from the Illinois Car & Manufacturing Company. Inquiry for 200 cars was reported in the *Railway Age* of September 11.

THE LOUISVILLE & NASHVILLE reported in the *Railway Age* of October 2 as having authorized the purchase of 1,000 gondola cars, 250 flat cars and 250 automobile cars is now inquiring for this equipment. These cars are all to be of 50 tons' capacity.

Passenger Cars

THE PENNSYLVANIA is placing orders for the electrical equipment for 128 multiple unit cars.

THE MARYLAND & PENNSYLVANIA has ordered one gas-electric, all passenger, rail motor car equipped with a model 120 power plant, from the Electro-Motive Company.

THE SOUTHERN PACIFIC is expected to enter the market for twenty 70-ft. steel baggage cars, one club car, ten 72-ft. steel coaches and five 72-ft. three-compartment steel coaches.

THE LONG ISLAND is in the market for 60 passenger motor cars and 30 trailer cars for electric service; 20 passenger cars for steam service and four combination passenger and baggage cars.

THE LOUISVILLE & NASHVILLE is now inquiring for six standard 70-ft. coaches, ten 70-ft. coaches with a middle smoking compartment, six 70-ft. coaches with an end smoking compartment, two 70-ft. passenger and baggage cars, two 60-ft. mail cars and two dining car shells. The authorization for the purchase by this road of 28 cars for passenger service was reported in the *Railway Age* of October 2.

THE CHICAGO & NORTH WESTERN has ordered four dining cars from the Pullman Car & Manufacturing Corporation. Inquiry for this equipment was reported in the *Railway Age* of September 11. The railroad has also purchased five 72-ft. gas-electric railway motor cars from the Electro-Motive Company. These cars are practically duplicates of the three cars delivered in May, having a 15-ft. railway post office, 16 ft. 8 in. for baggage and express and seats for 42 passengers.

Iron and Steel

THE UNION PACIFIC has ordered 23,000 tons of rail from the Illinois Steel Company.

THE NORTHERN PACIFIC has ordered 5,500 tons of rail from the Illinois Steel Company.

THE CENTRAL OF GEORGIA has ordered 16,000 tons of rail from the Tennessee Coal, Iron & Railroad Company.

THE ILLINOIS CENTRAL has ordered 31,000 tons of rail from the Tennessee Coal, Iron & Railroad Company, and 35,000 tons from the Illinois Steel Company.

Machinery and Tools

THE CHICAGO, BURLINGTON & QUINCY is inquiring for one 7½-ton, 37-ft. span electric crane.

THE NEW YORK CENTRAL has ordered a 50-ton hydraulic bushing press from Manning, Maxwell & Moore, Inc.

THE ELGIN, JOLIET & EASTERN has ordered one Micro cylinder grinder from Manning, Maxwell & Moore, Inc.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered a 48-in. car wheel borer from the Niles-Bement-Pond Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered two 14-in. by 6-ft. motor driven portable lathes from Manning, Maxwell & Moore, Inc.

THE ILLINOIS CENTRAL is inquiring for one 6-in. and one 2-in. pipe threading machine and one 2-in. or 3-in. pipe nipple making machine.

THE NEW YORK, NEW HAVEN & HARTFORD has ordered one 90-in. Putnam heavy driving wheel lathe, two double head axle lathes and two Putnam journal burnishing lathes from Manning, Maxwell & Moore, Inc.

THE PULLMAN COMPANY has ordered one Putnam journal axle lathe from Manning, Maxwell & Moore, Inc. This company has also ordered two car wheel lathes from the Niles-Bement-Pond Company.

THE MISSOURI PACIFIC has ordered two 1½-in. heavy pattern forging machines, one mud ring and flue sheet drill, one 2-in. double head bolt cutter and one mortiser and boring machine from Manning, Maxwell & Moore, Inc. The Missouri Pacific has placed an additional order for two 100-ton bushing presses with the Niles-Bement-Pond Company.

Signaling

THE NEW YORK, NEW HAVEN & HARTFORD has ordered from the Union Switch & Signal Company 24 color light signals, 31 relays and other apparatus for installation between Atlantic, Mass., and Braintree.

Supply Trade News

The Cleveland officers of the **Central Alloy Steel Corporation** and the **United Alloy Steel Corporation** have been combined and moved to 1716 Union Trust building.

Charles F. deBrunner has been appointed manager of the newly created plate and structural division of the **North American Car Corporation,** with headquarters at Tulsa, Okla.

R. C. Brower of the Automotive and Industrial Machinery Sales division of the **Timken Roller Bearing Service and Sales Company,** has been promoted to general manager, with headquarters at Canton, Ohio.

The name of the **Wayne Tank & Pump Company,** Fort Wayne, Ind., has been changed to the **Wayne Company.** The change is in name only and in no way affects the business status or policies of the company.

F. R. Pfaff, assistant advertising manager of Albert Pick & Company, has been appointed advertising manager of the **Independent Pneumatic Tool Company,** Chicago, to succeed Frank F. Leavenworth, resigned, to engage in other business..

George E. Tyson, who for the past twelve years has been in the production department of the **Reading Iron Company,** Reading, Pa., has been appointed representative in the Reading territory. Mr. Tyson's headquarters are in the general offices of the company at Reading.

Leland Brooks, formerly vice-president and treasurer of the Franklin Railway Supply Company, Ltd., Montreal, has been appointed special representative of the **Worthington Pump & Machinery Corporation,** with headquarters at Chicago. In addition to other duties Mr. Brooks will handle railroad sales in Canada.

The National Pole & Treating Company, Minneapolis, Minn., has been organized through the consolidation of the American Cedar Company and the Northern Tie & Treating Company. The officers of the new company are: **H. S. Gilkey,** chairman of the board; **Seymour W. Backus,** president; **L. A. Furlong** and **F. G. Moore,** vice-presidents; and **William F. Brooks,** secretary and treasurer.

September Shipments of Locomotives

September shipments of railroad locomotives from principal manufacturing plants, based on reports received by the Department of Commerce, compared with other months are as follows:

Year and month	Shipments					Unfilled orders end of month				
		Domestic		Foreign			Domestic		Foreign	
	Total	Steam	Electric	Steam	Electric	Total	Steam	Electric	Steam	Electric
1925										
January	98	41	12	43	2	414	322	44	33	15
February	88	69	7	9	3	414	318	51	33	12
March	117	88	13	14	2	461	324	51	71	15
April	101	78	14	9	0	490	343	41	77	29
May	101	65	9	25	2	478	324	48	75	31
June	114	58	8	42	6	411	274	47	65	25
July	76	56	12	4	4	386	259	39	65	23
August	118	91	6	13	8	334	199	48	72	15
September	100	42	16	34	8	390	278	41	64	7
Total (9 months)	913	588	97	193	35	...	...	...	...	...
1926										
January	121	96	11	14	0	653	506	53	52	42
February	163	101	22	38	2	572	442	60	30	40
March	162	146	11	4	1	780	635	50	54	41
April	151	122	12	1	16	713	580	44	60	29
May	140	105	14	12	9	726	585	46	72	23
June	159	133	11	12	3	667	522	53	72	20
July	132	82	20	30	0	555	445	36	51	23
August	124	78	*16	*23	7	525	455	*26	*28	16
September	134	109	13	5	7	498	386	24	77	11
Total (9 months)	1,286	972	130	139	45	...	...	...	...	...

* Revised.

Obituary

William J. Watson, organizer of the Buda Foundry & Manufacturing Company, the Hewitt Manufacturing Company and the Fort Madison Iron Works, died in Chicago on October 1. He was born on March 26, 1843, in Philadelphia, Pa., entered business in 1863 and in 1870 was appointed a representative of the Middleton Car Spring Company, with headquarters at St. Louis, Mo. He was transferred to Chicago on May 1, 1873, and was elected president in 1890. He organized the Buda Foundry & Manufacturing Company in 1884, the Hewitt Manufacturing Company in 1886, and the Fort Madison Iron Works in 1887, serving as president of these corporations.

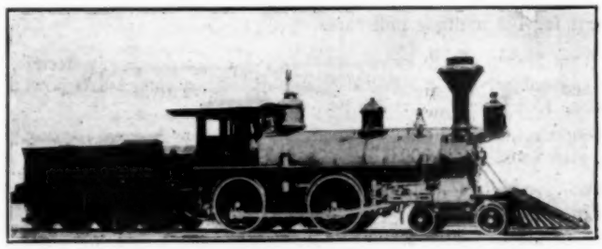
Trade Publications

SUPERHEATED STEAM PYROMETERS.—The Model 496 pyrometer for superheater locomotives is described in the third edition of the instruction book on superheated steam pyrometers which has been prepared by the Superheater Company, 17 East Forty-second street, New York. Instructions for the installation, operation and maintenance of the pyrometer, and a convenient list of parts are given in the book.

STAINLESS STEEL AND STAINLESS IRON.—Working instructions for Bethlehem stainless steel forging and stainless iron forging are given in Booklet No. 113, which has been issued by the Bethlehem Steel Company, Bethlehem, Pa. These metals can be rolled, forged, pressed and hammered, and can be used for machinery parts, especially those subjected to strong corrosive agents.

RAILROAD SAND DRYING EQUIPMENT.—The Roberts & Schaefer Company, Chicago, has issued Bulletin No. 81 of 12 pages, containing detailed descriptions and illustrations of the various component parts of locomotive sanding plants. Among the features described is the Perfection cone stove sand dryer, the Beamer steam sand dryer, automatic sand drums, sand valves, telescoping dome spouts, etc. In addition, brief descriptions and illustrations are given of complete sand drying plants installed by this company.

MODERN YARD OPERATION.—The Union Switch & Signal Company has issued a 92-page 6-in. by 9-in. book in fabrikoid binding which explains the installation and operation of car retarder systems in hump yards. From the economic standpoint, data are incorporated showing that an existing installation of car retarders is effecting a saving equal to 38.7 per cent on the investment. An engineering explanation of the grades required for retarder hump yards is then given, followed by directions for training operators. A chapter is devoted to a technical description of the electro-pneumatic car retarder system, including an outline of the principal items to be considered in making estimates for such installations. The second section is devoted to an extensive illustrated description of the installation of the Union electro-pneumatic car retarder system in service in the northbound classification yard on the Illinois Central at Markham yard near Chicago. The preliminary studies, engineering features, mechanical facilities, communication system, signaling, yard lighting and operating methods, are each dealt with in separate chapters. Large folded inserts show the layout of the yard, the location of the retarders and the grades at different points. Reproductions of photographs showing the car retarders in service appear profusely throughout the book and the signal indication diagram and the frontispiece for each section of the book are printed in four and five colors.



A Rogers-Built 4-6-0 for the Missouri Pacific

Railway Construction

ALABAMA, TENNESSEE & NORTHERN.—This company has applied to the Interstate Commerce Commission for authority to build an extension from a point near Summit, Ala., to the port of Mobile, 30 miles.

CENTRAL OF NEW JERSEY.—This company has awarded a contract to the Stillman-Delehanty-Ferris Company, Jersey City, N. J., for the removal of an overhead bridge at Hudson county boulevard, Bayonne, N. J., at an estimated cost of $38,750.

CHESAPEAKE & HOCKING.—This company, organized by the Chesapeake & Ohio, has applied to the Interstate Commerce Commission for authority to build the line between Gregg and Valley Crossing, Ohio, about 63 miles of double track, connecting the C. & O., and the Hocking Valley, for which authority was formerly asked by the New York, Chicago & St. Louis. In its decision denying the Van Sweringen merger application the commission denied this application without prejudice to its resubmission by the Chesapeake & Ohio. Later it was resubmitted by the Nickel Plate but protests have been filed by C. & O., minority stockholders. The new application states that the line will be controlled and operated by the C. & O., under a lease or other operating arrangement approved by the commission.

CHICAGO & NORTH WESTERN.—A contract has been let to the Ellington-Miller Company, Chicago, for the construction of six frame storage buildings for the car department at the Proviso, Ill., yards, estimated to cost $40,000.

CHICAGO, BURLINGTON & QUINCY.—A contract has been awarded to George Roby, Bushnell, Ill., for the rebuilding of the station at Bushnell. Company forces are rebuilding the station at Buda, Ill. These projects involve a total expenditure of about $25,000.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—A contract has been let to the Walsh Construction Company, Chicago, for the construction of a one-story passenger station of Bedford stone at Bedford, Ind., which with accompanying improvements is estimated to cost $50,000.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has been authorized by the District court of Northern Illinois, Chicago, to expend $575,000 for improvement and maintenance, including $56,000 for new trackage at Belt Junction, Ind., additional yard tracks at Cedar Rapids, Ia., interchange track at Davenport, Ia., extension of passing track at Newtown, Mo.; $70,000 for bridge and concrete culvert work at Madrid, Ia., Albany, Ill., Bovill, Idaho, and Denton, Mo., and $449,000 for an extension to the freight station at Aberdeen, Wash., and for maintenance work.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract has been awarded to the Bates & Rogers Construction Company, Chicago, for the construction of several pile bridges on the Ponca City line at Tonkawa, Okla., at a cost of about $25,000.

CHARTIERS SOUTHERN.—This company has applied to the Interstate Commerce Commission for authority to build an extension from Mather to Waynesburg, Pa., 7.6 miles.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—Bids will be asked during October for the construction of buildings in connection with the construction of the Riverside Yard and engine terminal at Cincinnati, Ohio.

ERIE.—This company has awarded a contract to the Rayen Company, Youngstown, O., for the construction, in 1927, of a warehouse and freight terminal at Youngstown, O., at an estimated cost of $1,000,000.

FLORIDA EAST COAST.—A contract has been awarded to the Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa., for the construction of water station improvements and a treating plant at New Smyrna, Fla., estimated to cost $74,000.

GREAT NORTHERN.—Bids are being received for three changes in the main line on the Spokane division, estimated to cost $354,000.

GREAT NORTHERN.—A contract has been let to Hanson Brothers for the grading of an industrial branch, 3 miles long, to a packing plant at West Fargo, N. D., to cost about $54,000.

GREAT NORTHERN.—This company contemplates the construction of a tie-treating plant at Hillyard, Wash., most of the work, which is estimated to cost $422,000, to be done by company forces.

GREAT NORTHERN.—A contract has been awarded to Stone & Webster, New York, for the construction of an electrical transmission line in the Cascade mountains, near Skykomish, Wash., incident to the electrification of the line between Gold Bar, Wash., and Wenatchee, which, with the construction of a sub-station, is expected to involve an expenditure of about $704,000.

GREAT NORTHERN.—A contract for the concrete and steel construction of the superstructure of the second section of Dock No. 1 at Allouez, Wis., has been awarded to Peppard & Fulton, Minneapolis, Minn. Bids will be received during October for the construction of the substructure of the third section while bids for the superstructure of this section will be accepted about September, 1927. The entire project is estimated to cost $2,756,000.

HOUSTON NORTH SHORE.—A contract has been awarded to the Virginia Bridge & Iron Company, Roanoke, Va., for bridge work at Houston, Tex., estimated to cost $30,000.

LOUISVILLE & NASHVILLE.—A contract has been let to the Roberts & Schaefer Company, Chicago, for hoisting machinery to be installed in an existing coaling station at North Hazard, Ky.

MICHIGAN CENTRAL.—A contract has been awarded to the Ellington-Miller Company, Chicago, for the construction of a 10-stall reinforced concrete roundhouse at Windsor, Ont., at a cost of $110,000.

MISSOURI PACIFIC.—A contract has been awarded to the American Construction Company, Omaha, Neb., for the construction of a concrete and brick freight house at Omaha, at a cost of $220,600. At Osawatomie, Kan., a contract has been let to the J. R. Van Sant Construction Company, Kansas City, Mo., for the construction of a powerhouse and engine room to cost $49,800 and to T. H. Johnson, Sedalia, Mo., for the construction of a one-story brick and steel planing mill to cost $52,500. A contract has been let to S. M. Bate & Co., Kansas City, Mo., for the construction of a brick and concrete freight house, two stories high, at Coffeyville, Kan., at a cost of $101,200. A contract for the construction of a mechanical coaling station at Washington, Mo., has been awarded to the Folwell-Ahlskog Company, Chicago, at an estimated cost of $52,000. At Cricket, Ark., a contract has been let to the Gunite Construction Company, Kansas City, for the relining of a tunnel with a contract price of $83,500. A contract has been awarded to the List & Weatherly Construction Company, St. Louis, Mo., for the strengthening of the pivot pier on the bridge at New Augusta, Ark., at a cost of $93,000.

NEW ORLEANS GREAT NORTHERN.—A contract for grading the right of way of the extension from Nogan, Miss., to the west bank of the Pearl river near Jackson, Miss., 6.65 miles, has been let to the Lawrence Construction Company, Jackson. The estimated cost of construction is $623,000.

NEW YORK CENTRAL.—This company has awarded contracts totaling approximately $758,000 as follows: to the National Boiler Washing Company, Chicago, for the installation of a boiler washing and filling system for locomotive boilers in engine house at East Syracuse, N. Y., estimated cost $70,000; to the General Electric Company, New York, for electrical equipment for sub-station at 43rd street, New York, estimated cost $255,000; to H. H. Sherwin & Co., Inc., New York, for the construction of duct lines and splicing chambers between Spuyten Duyvil, N. Y., and Riverdale, N. Y., estimated cost, $150,000; to the Grinnell Company, Inc., New York, for the installation of automatic sprinkler system on Pier F, North River, New York, estimated cost, $33,000; to the Jobson,

Gifford Company, New York, for the construction of bridge to eliminate grade crossing at Van Cortlandt Park South over the Putnam division tracks, estimated cost, $110,000; to the L. M. Neckermann Company, New York, for the construction of freight house at West 135th street and 12th avenue, New York, estimated cost, $140,000.

Norfolk & Western.—This company has awarded a contract to the Virginia Bridge & Iron Company, Roanoke, Va., for bridge work on their line. The estimated cost is $45,000.

Pennsylvania.—Bids are being received for the construction of grade separation structures at Fifty-first and Fifty-second streets near Western avenue, Chicago.

Pennsylvania.—This company has awarded contracts totaling approximately $950,000 as follows: to the Walsh Construction Company, Davenport, Ia., for grading and masonry for section 1 of double track cut off from Collinsville, Ill., to St. Jacob, Ill., estimated cost $315,000; to the Walsh Construction Company, Davenport, Ia., for grading and masonry for section 2, of double track cut off from Collinsville, Ill., to St. Jacob, Ill., estimated cost $300,000; to the George A. Fuller Company, New York, for the construction of new cab ramps and passageways, Pennsylvania Station, New York, estimated cost, $190,000; to W. F. Trimble Sons Company, Pittsburgh, Pa., for construction of a 7-stall enginehouse and machine shop, storehouse, and oil house at Shire Oaks, Pa., estimated cost, $90,000; to the Milliron Construction Company, Du Bois, Pa., for the construction of overhead bridge to eliminate grade crossing at Mann's Narrows, Pa., estimated cost, $55,000.

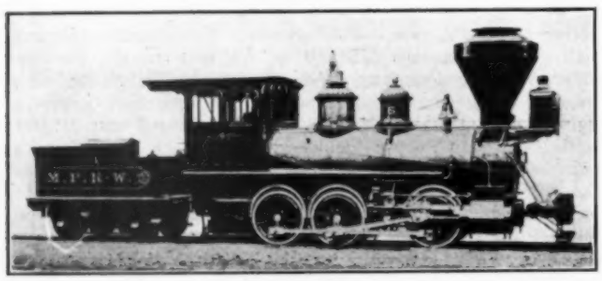
Rio Grande, Micolithic & Northern.—The Interstate Commerce Commission has authorized this company, organized in the interests of the Micolithic Company, to construct a railroad from a connection with the Galveston, Harrisburg & San Antonio, at a point approximately 123 miles east of El Paso, Tex., in a southerly direction for about 6.4 miles. The estimated cost of construction is $105,721.

Seaboard Air Line.—This company will receive bids on October 9 for the construction of a freight depot at Sarasota, Fla., estimated to cost from $75,000 to $100,000.

St. Louis-San Francisco.—Bids will be received in the near future for the construction of 57 miles of line from Aberdeen, Miss., to Aliceville, Ala., a portion of the proposed extension from Aberdeen to Kimbrough, Ala., a distance of 152 miles.

St. Louis-San Francisco.—A contract has been awarded to J. H. Leveck & Son, Little Rock, Ark., for the construction of a combined freight and passenger station at Crystal City, Mo., at a cost of $20,000. A contract has been let to the George Griffiths Construction Company, St. Louis, Mo., for the construction of a combined freight and passenger station at Neosho, Mo., at a cost of about $18,000. This company will also remodel and extend its roundhouse and install a 100-ft. turntable at Kansas City, Mo., at a total cost of $150,000, the contract for building work being let to C. E. Hamilton, Kansas City.

Union Pacific.—Bids are being received for the construction of a passenger station at Yakima, Wash., and for the construction of a fireproof concrete oil storage building at Milford, Utah.



An Early Switcher on the Missouri Pacific, Built by Rogers

Railway Financial News

Boston & Maine.—*Abandonment.*—The Interstate Commerce Commission has made public a proposed report by Examiner Jameson on this company's application for authority to abandon four branch lines in Massachusetts aggregating about 24 miles. The examiner recommends that the commission permit the abandonment of the portion of the Reformatory branch between Concord and Reformatory, 2.6 miles, but not that portion between Bedford and Concord, 4.4 miles; also the entire Bedford-North Billerica branch and the portion of the Essex branch between Essex and Conomo but not the portion between Hamilton-Wenham station and Essex or the Ashburnham branch.

Chicago, Milwaukee & St. Paul.—*To Appeal Decision.*—The Bondholders' Defense Committee, headed by Edwin C. Jameson, president of the Globe & Rutgers Fire Insurance Company, has stated that it will appeal from the recent decision of Judge Wilkerson in the Federal District Court at Chicago denying leave to intervene and ordering the foreclosure sale of the road on November 22. Mr. Jameson has issued a statement which reads as follows:

"Our counsel's advice is that the court has not refused us the right to present our objections to the plan, but merely determined that the objections should be presented next December, instead of at the present time. The court also expressly refuses to pass on the question whether the reorganization managers should be permitted to buy the property at the upset price of $122,500,000 set by the court. This figure merely determines the amount of deposits that must be made by prospective bidders prior to the sale, these deposits being fixed in the decree at 5 per cent of the upset price."

Chicago, St. Paul, Minneapolis & Omaha.—*Equipment Trust.*—The Interstate Commerce Commission has authorized the issuance of $410,000 4¾ per cent equipment trust certificates, series C, to be sold to Kuhn, Loeb & Co. at not less than 100.803 per cent of par or sold through competitive bidding at not less than par. The equipment includes 8 Mikado type locomotives having a total estimated cost of $550,080. See article on another page of this issue entitled "I. C. C. Again Urges Competitive Bidding."

Georgia & Florida.—*Reorganization.*—R. Lancaster Williams, representing the bondholders' committee of the Georgia & Florida Railway, has applied to the Interstate Commerce Commission for authority for the Georgia & Florida Railroad to take over the 404 miles of line of the old company and the property of the Statesboro Northern, the stock of which is owned by the receiver of the Georgia & Florida, and to construct an extension from Augusta, Ga., to Greenwood, S. C., 56 miles, making a total for the entire system of approximately 500 miles.

Georgia & Florida.—*Equipment Trust and Receiver's Certificates.*—The Interstate Commerce Commission has approved the issuance of $750,000 of equipment trust certificates and not less than $250,000 nor more than $271,900 of receiver's certificates, in connection with the purchase of 530 freight cars having a total approximate cost of $1,003,000. The equipment trust certificates are to be sold to the Harrison, Smith & Co. of New York and Philadelphia at a price of 97.48. These certificates were sold after competitive bidding, offers having been received from 11 bankers. The receiver's certificates are to bear 6 per cent interest; $120,000 are to be issued to the National Park Bank of New York and $130,000 to the American Car & Foundry Company.

Hudson Valley.—*Section 15a not Applicable.*—The Interstate Commerce Commission has decided that Section 15a of the Interstate Commerce Act does not apply to this company which is controlled through stock ownership by the Delaware & Hudson. The decision is made on the basis that the company is an interurban railway and is not engaged in the general transportation of freight within the meaning of the section.

Illinois Central.—*Bonds.*—The Interstate Commerce Commission has authorized the issuance of $35,000,000 40-year 4¼ per cent bonds to be sold to Kuhn, Loeb & Co. at not less than 96.35 per cent of par. The proceeds will be used to reimburse the company for capital improvements.

ILLINOIS CENTRAL.—*Equipment Trust.*—The Interstate Commerce Commission has approved the issuance of $4,665,000 4½ per cent equipment trust certificates, series N, which may be sold to Kuhn, Loeb & Co. at not less than 99.517 per cent of par or offered for sale through competitive bidding and sold at not less than 98.43 per cent of par. The Illinois Central had intended to sell the certificates to Kuhn, Loeb & Co. at 98.43. The equipment includes 70 locomotives having a total approximate cost of $6,232,000. See article on another page of this issue entitled "I. C. C. Again Urges Competitive Bidding."

INDIANA HARBOR BELT.—*Note.*—The Interstate Commerce Commission has granted authority for the issuance of a 4½ per cent demand promissory note for $500,000 covering a loan to be obtained either from the Michigan Central or from some bank.

KANSAS, OKLAHOMA & GULF.—*Bonds.*—The Interstate Commerce Commission has authorized an issue of $500,000 of 5 per cent gold bonds, to be sold at not less than par, the proceeds to be used to repay advances.

MACON & BIRMINGHAM.—*Abandonment.*—The Public Service Commission of Georgia has issued a preliminary order permitting the abandonment of this road, but making the order effective January 1, 1927, under a final order to be issued on that date, in event that persons seeking to operate the road are unable to work out an operative plan by that date. Two offers for the railroad have been refused by the receivers, one of $100,000 made by William Summers of Gainesville, Pa., and the other of $125,000 made by the Bank of LaGrange, Ga. The road extends from Macon, Ga., to La Grange, 98 miles, and suspended operations several years ago.

MANISTEE & NORTHEASTERN RAILWAY.—*Stock Issue.*—The Interstate Commerce Commission has authorized this company to issue $1,103,700 of capital stock in consideration of the conveyance to it by the purchaser at receiver's sale of the properties heretofore owned by the Manistee & Northeastern Railroad.

MILLTOWN AIR LINE.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Milltown to Naylor, Ga.

MINNEAPOLIS & ST. LOUIS.—*Iowa Central Bondholders' Protective Committee.*—The Bondholders' Protective Committee of the Iowa Central 5 per cent first mortgage 50-year bonds headed by George E. Roosevelt of Roosevelt & Son, has sent the following notice to holders of these bonds under date of October 1.

Since it was constituted your committee has closely followed the operation of the property and the legal steps in connection with the foreclosure of the various mortgages on the Minneapolis & St. Louis system. The chairman of your committee has just completed an inspection trip during which he went over all the main line of the Iowa Central and most of the Minneapolis & St. Louis.

It seems clear that the property requires a substantial program of tie and ballast improvement and also some curve and grade revision. In order to operate more economically it is also necessary to secure some additional heavier power and more cars—principally box cars. With this expenditure of money, and if there is an increase in rates in the territory served by the road, concerning which we are optimistic, we feel that the company when reorganized would have greatly increased earnings.

The foreclosure proceedings in the various mortgages have now reached a point where, unless an agreement among them can be reached by negotiation, there will have to be extended and expensive litigation to determine the property covered by the several mortgages, respectively, particularly as to the equipment. We feel that if it is possible, it is better to negotiate these questions than to litigate them, and your committee will endeavor to conduct such negotiations. However, in order to conduct such negotiations satisfactorily and successfully, it is helpful to have the support of as many bondholders as possible. Therefore, we urge the prompt deposit of all bonds with Bankers Trust Company, depositary for the committee.

The net earnings of the Minneapolis & St. Louis System for the year ended December 31, 1925, were $220,623 before interest charges, and for the seven months ended July 31, 1926, there was a deficit (after expenses, taxes and rentals) of $451,684. With this discouraging situation regarding earnings, the necessity of united action by the bondholders is still further emphasized.

NACOGDOCHES & SOUTHEASTERN.—*Abandonment.*—This company has been authorized by the Interstate Commerce Commission to abandon operation over the line of the Frost Lumber Industries, Inc., from Oil Springs, Tex., to La Cerda, 6 miles, in Nacogdoches County. The reason for abandonment is that the lumber company discontinued operation in this section and intends to dismantle its line due to the fact that the lumber has been cut off. A new line has been built by the lumber company.

NEW YORK CENTRAL.—*Lease.*—The Interstate Commerce Commission has authorized the New York Central to renew its lease of the Hudson Connecting Railroad.

OHIO RIVER & WESTERN.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its entire line, which is narrow gage, from Bellaire to Zanesville, Ohio, 110 miles.

PENNSYLVANIA TUNNEL & TERMINAL.—*Tentative Valuation.*—A final value of $120,000,000 was placed on the carrier property owned as of 1918 in a tentative valuation report issued by the Interstate Commerce Commission. The company owns the passenger station and facilities of the Pennsylvania at New York City, including the electrically-operated road from Manhattan Transfer, N. J., to the station and from the station to Long Island City. The book investment in road and equipment, including land, was stated in the company's books as $108,088,558 but the report says it is not known whether or not the recorded adjustments included in the amount effect a proper distribution of costs between carrier and non-carrier property. The cost of reproduction new was placed at $105,907,168 and the cost of reproduction less depreciation at $98,775,572. The present value of carrier lands, not included in the cost of reproduction, was placed at $17,428,851.

POCHUCK.—*Abandonment.*—The Pochuck and the Lehigh & New England, lessee, have been authorized by the Interstate Commerce Commission to abandon that portion of the line of the Pochuck Railroad from Mile Post 1 to Glenwood, N. J., 2.384 miles, which is the better portion of the line of the subsidiary company which extends from Glenwood Junction, N. J., to Glenwood 3.4 miles. The line was originally constructed to serve granite quarries and was extended to Glenwood for the purpose of transporting milk, farm produce, etc. The operation of the quarries has been discontinued and it was shown that other means of transportation are available for the other commodities.

SEABOARD AIR LINE.—*Equipment Trust.*—S. Davies Warfield, president, announced on October 1 that negotiations have been completed with Dillon, Read & Co., of New York, for the sale of $11,336,000 equipment trust certificates covering the purchase of 50 locomotives, 80 passenger train cars and 3,450 freight train cars.

SOUTHERN.—*New Director.*—F. S. Wynn, a vice-president, has been elected a director to fill a vacancy caused by the death of Robert Jemison, Sr.

SOUTHERN.—*Stock Issue Plan.*—A report is current that a special meeting of the stockholders of the Southern Railway will be called in November to consider the advisability of increasing the company's common stock. It is stated that the amount of the increase may be about $30,000,000 and the rights of subscription will be offered to holders of common and preferred stock. A statement was also made that the question was being considered of increasing dividends on the preferred stock from 5 to 6 per cent. President Fairfax Harrison has indicated that the financing by stock is in contemplation but he has stated that it is not proposed to increase the rate on the preferred stock. His official statement issued at Washington on October 4 follows:

"President Harrison stated that the publicity given to the common stock financing plan of the company was premature, and that no official statement concerning the details could be made until after the meeting of the board of directors, to be held in Richmond on October 12, but that, nevertheless, he deemed it desirable at this time to say for the information of all concerned that the plan under consideration does not contemplate the payment of an increased individend on the preferred stock, as intimated in the premature newspaper articles, but does contemplate the extension of subscription privileges to preferred as well as to common stockholders."

SPOKANE, PORTLAND & SEATTLE.—*Tentative Valuation.*—The Interstate Commerce Commission has issued a tentative valuation report placing the final value for rate-making purposes of the property owned and used for common carrier purposes at $56,800,000 as of 1916. The final value of the property used was placed at $58,278,033. The outstanding capitalization as of valuation date was $124,587,612, and the book investment in road and equipment, including land, was $61,266,413. Readjustments required by the accounting examination would reduce this to $60,-

602,821, according to the report. The cost of reproduction new of the carrier property owned and used was placed at $47,815,402 and the cost of reproduction, less depreciation, at $44,427,615, exclusive of land. The company owned and used 10,699 acres of carrier land, assigned a present value of $6,508,558, and it held $41,714,887 par value of securities of other companies, recorded in its accounts at $38,647,458 book value.

WESTERN NEW YORK & PENNSYLVANIA.—*Tentative Valuation.*—The Interstate Commerce Commission's tentative valuation report, as of 1918, states the final value for rate-making purposes at $43,136,236 for the property owned by this company, which is leased to the Pennsylvania and forms an important part of its Allegheny and Buffalo divisions. The outstanding capitalization on valuation date was $81,232,387 and the book investment in road and equipment was $71,022,449. With readjustment required by the accounting examination, the report says, this would be reduced to $68,202,763. The cost of reproduction new was placed at $43,274,186 and the cost of reproduction less depreciation at $34,247,246.

WRIGHTSVILLE & TENNILLE.—*New Directors.*—J. J. Pelley, president of the Central of Georgia, and H. L. Shannon, vice-president of the Tennille Banking Company, have been elected directors succeeding L. A. Downs who has become president of the Illinois Central and Dr. C. V. Smith, deceased.

WHEELING & LAKE ERIE.—*Bonds.*—Otis & Co. of Cleveland are offering $2,000,000 refunding mortgage 5 per cent bonds, series B, at 99.15 and accrued interest, to yield about 5.05 per cent. Approval of this issue by the Interstate Commerce Commission was reported in the *Railway Age* of August 28.

Valuation Reports

The Interstate Commerce Commission has made public tentative valuation reports stating the final value for rate-making purposes of the property owned and used for common-carrier purposes, as of the respective valuation dates, as follows:

Atlanta Terminal Company	$2,926,315	1918
Harlem Transfer Company	925,000	1918
Lackawanna & Montrose	205,000	1918
Louisville, Henderson & St. Louis	$5,940,000	1918
Pittsburgh & Shawmut	10,515,000	1919
Northwestern Terminal	126,500	1919
New Orleans Public Belt	132,500	1918

Dividends Declared

Atchison, Topeka & Santa Fe.—Common, $1.75, quarterly, payable December 1 to holders of record October 29.

Baltimore & Ohio.—Common, 1½ per cent, quarterly; preferred, 1 per cent, quarterly, both payable December 1 to holders of record October 17.

Delaware, Lackawanna & Western.—3 per cent, quarterly, payable October 29 to holders of record October 9.

Norfolk & Western.—Adjustment preferred, 1 per cent, quarterly, payable November 19 to holders of record October 30.

Norwich & Worcester.—Preferred, 2 per cent, quarterly, payable October 1 to holders of record September 18.

Pennsylvania Company.—1¼ per cent, quarterly, payable September 30 to holders of record September 29.

Average Price of Stocks and Bonds

	Oct. 5	Last Week	Last Year
Average price of 20 representative railway stocks	100.15	104.28	86.08
Average price of 20 representative railway bonds	97.73	98.01	91.61

ONE OF THE RAILROAD novelties to be seen in Williamsport, Pa., is a locomotive which starts and stops according to the movements of a "stop-and-go" signal, the kind now common in the streets of American cities. That is to say, this locomotive is in switching service in a section of the city where the track lies in the street—Hepburn street—and, in its trips on that street, crosses two of the main east and west avenues of the city, Third street and Fourth street. These crossings have the usual signs and the locomotive is moved in accordance with the indications, the same as is done by motor cars and pedestrians. At these streets the railroad suspends the rule requiring a brakeman to go ahead at each crossing to flag the train across.

Railway Officers

Executive

G. L. R. French, general manager of the Rutland, with headquarters at Rutland, Vt., has been appointed assistant vice-president and general manager, with the same headquarters.

Frederic G. Dorety, general solicitor of the Great Northern, with headquarters at St. Paul, Minn., has been elected vice-president and general counsel, with the same headquarters, succeeding **M. L. Countryman,** who retired from active service on October 1, but who will remain with the railroad as special counsel. Mr. Countryman was born on August 27, 1862, at Nininger, Minn., and studied law at Washington University, St. Louis, Mo., where he graduated in 1886. He entered railway service in January, 1903, with the Great Northern as an assistant general solicitor, with headquarters at St. Paul, where he remained until 1916, when he was promoted to general attorney at the same place. In 1918, he was promoted to general solicitor and in March, 1922, he was elected vice-president and general counsel, with headquarters at St. Paul, a position he held until his retirement as advisory counsel.

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M. L. Countryman

Financial, Legal and Accounting

William H. Whitehead, who has been appointed comptroller of the Reading, with headquarters at Philadelphia, Pa., was born on June 18, 1874, in Weisport, Pa. He received his education in the public schools and a business college. He first entered railroad service in 1891 as an office boy in the motive power department of the Lehigh Valley. He subsequently served as general bookkeeper and accountant in the storehouse department, chief accountant for the engineer maintenance of way, and special accountant for the general manager of this company. In March, 1913, he entered the service of the Lehigh & New England, and in September, 1921, was appointed auditor, which position he held until July, 1924, when he became general auditor of the same company, serving in this capacity until the time of his recent appointment as comptroller of the Reading. He is also secretary and treasurer of the Lehigh & Delaware Transpor-

W. H. Whitehead

tation Company, a subsidiary of the Lehigh Coal & Navigation Company.

William K. Bean, assistant to the comptroller of the Reading, has been appointed assistant comptroller, with headquarters at Philadelphia, Pa.

R. J. Hagman, assistant general solicitor of the Great Northern, with headquarters at St. Paul, Minn., has been promoted to assistant general counsel, with the same headquarters. **Charles F. Albert,** attorney for Idaho and eastern Washington, with headquarters at Spokane, Wash., has been appointed general attorney with jurisdiction over legal matters in western Washington and Oregon, and assigned matters in eastern Washington and Idaho, with headquarters at Seattle, Wash., succeeding **Thomas Balmer,** promoted to assistant general counsel. **Ernest E. Sargeant,** assistant attorney, with headquarters at Spokane, will replace Mr. Albert as attorney for Idaho and eastern Washington, with the same headquarters. **Edwin C. Matthias,** assistant attorney at Spokane, has been appointed attorney for western Washington, with headquarters at Seattle.

Operating

J. W. Burkhalter has been promoted to trainmaster on the Toledo, Peoria & Western.

Fred F. Phillips has been appointed acting superintendent on the Coast lines of the Atchison, Topeka & Santa Fe on special service, succeeding Cade Selvy, retired.

A. T. Lowmaster, who has been appointed general superintendent of transportation of the Chesapeake & Ohio, with headquarters at Richmond, Va., was born on August 29, 1882, at McCutchensville, Ohio. He received his education in the public schools and a business college. He entered railway service on October 3, 1900, as a clerk in the master carpenter's office of the Erie. In July, 1903, he was transferred to clerk in the division engineer's office at Huntington, Ind., which position he held until March, 1904, when he became a clerk in the trainmaster's office of the same road and with the same headquarters. In June, 1906, he was promoted to voucher and statistical clerk in the general agent's office of the Erie at Chicago, Ill., and in September, 1910, he was promoted to chief clerk in the general agent's office, with the same headquarters. In April, 1911, he became chief clerk to the superintendent of terminals and construction of the Cheapeake & Ohio, with headquarters in Chicago. From 1912 to 1916, he was general agent for this road at Chicago, and in July, 1916, was promoted to superintendent of terminals, with the same headquarters. In November, 1917, he was promoted to assistant superintendent of transportation, with headquarters in Richmond, Va., and in September, 1923, was appointed superintendent of transportation, with the same headquarters.

Foster Studio, Richmond, Va.

A. T. Lowmaster

Donald M. McRae has been appointed general manager of the Havana Central and United Railways of Havana, with headquarters at Havana, Cuba. Mr. McRae succeeds T. P. Mason, who has resigned because of ill health.

J. W. Crane, assistant superintendent on the Western region of the Canadian National, with headquarters at Saskatoon, Sask., has been promoted to superintendent, with headquarters at Prince Albert, Sask., succeeding **J. Irwin,** deceased. Mr. Crane will be replaced by **J. A. Rogers,** division engineer, with headquarters at Saskatoon.

Homer R. Lake, who has been promoted to superintendent of transportation of the Atchison, Topeka & Santa Fe, with headquarters at Chicago, was born October 26, 1882, at Eagle Lake, Tex. He entered railway service on August 15, 1898, as a bill clerk on the Choctaw, Oklahoma & Gulf (now a part of the Chicago, Rock Island & Pacific), and in February, 1901, he was promoted to chief clerk to the timekeeper. During the same year he was appointed timekeeper and in 1902 chief clerk to the superintendent. He served then until June, 1904, consecutively as transportation clerk in the general superintendent's office, as general timekeeper and as a clerk in the general superintendent's office, when he was appointed chief clerk to the general superintendent of the Midland Valley. From October, 1905, to May, 1909, he was transportation clerk in the office of the general superintendent of the Atchison, Topeka & Santa Fe at La Junta, Colo., and Newton, Kan., and until July, 1915, he served as chief clerk in the office of the general superintendent at La Junta and at Topeka, Kan. He was then promoted to trainmaster, with headquarters at Emporia, Kan., and in January, 1919, he was again promoted to assistant superintendent at Wellington, Kan. During the same year he was appointed acting superintendent and later he was made superintendent. In March, 1926, he was made acting superintendent of transportation, where he remained until his promotion to superintendent of transportation.

Homer R. Lake

G. D. Brooke, who has been appointed general manager of the Chesapeake & Ohio, with headquarters at Richmond, Va., was born on September 15, 1878, at Sutherlin, Va., and was graduated from the Virginia Military Institute in 1900. He entered railroad service on July 17, 1902, as a rodman with the Baltimore & Ohio. From August, 1902, to December, he held the position of levelman, and from December, 1902, to May, 1904, was a transitman. In May, 1904, he was promoted to assistant engineer in charge of a field party, which position he held until March, 1905, when he was made assistant engineer in charge of location surveys at Cumberland, Md. In July, 1908, he was promoted to assistant division engineer, with headquarters at Pittsburgh, Pa., holding this position until July, 1909, when he was made division engineer, with headquarters at Baltimore, Md. From March, 1911, to February, 1912, he was assistant engineer in the operating department, and from February, 1912, to September, 1912, he served as assistant superintendent at Keyser, W. Va. In September, 1912, he was promoted to superintendent of the

G. D. Brooke

Shenandoah division, with headquarters at Winchester, Va., which position he held until April, 1914, when he was transferred to the Ohio division, with headquarters at Chillicothe, O. In October, 1916, he was transferred to the Cumberland division, with headquarters at Cumberland, Md., and from May, 1918, to July, 1918, he was special representative of the transportation department at Baltimore, Md. He entered the United States Railroad Administration service in July, 1918, as supervisor in the operating division at Philadelphia, Pa., which position he held until March, 1919, when he returned to the Baltimore & Ohio as superintendent of transportation of the Western lines, with headquarters at Cincinnati, O. In August, 1924, he was appointed assistant to the vice-president in charge of operation of the Chesapeake & Ohio, with headquarters at Richmond, Va., which position he held until the time of his recent appointment.

T. W. Love, general road foreman of engines of the Missouri Pacific, has been appointed trainmaster of the Wagoner district of the Central division, with headquarters at Van Buren, Ark., succeeding **S. E. Willis,** deceased.

L. G. Morphy, chief engineer of the Rutland, with headquarters at Rutland, Vt., has been appointed general superintendent, with the same headquarters. He will continue to act as chief engineer in addition to his new duties.

L. F. Branan, chief dispatcher of the Seaboard Air Line, with headquarters at Jacksonville, Fla., has been appointed assistant trainmaster, South Carolina division, to succeed **J. T. Elmore,** promoted. **L. S. Kinnebrew** has been appointed chief dispatcher of South Carolina division, with headquarters at Jacksonville, Fla., succeeding Mr. Branan.

A. D. Edgar, superintendent of the central division of the Central of New Jersey, with headquarters at Jersey City, N. J., resigned on September 30, 1926, because of ill health. **Charles H. English,** assistant superintendent, with headquarters at Jersey City, N. J., has been appointed to succeed Mr. Edgar. **A. R. Young,** passenger trainmaster, with headquarters at Jersey City, has been appointed assistant superintendent, with the same headquarters. **W. L. Vanderhoof,** freight trainmaster, has been appointed passenger trainmaster, succeeding Mr. Young. **George W. DeGraff,** assistant trainmaster, has been appointed freight trainmaster. **M. J. Haggerty,** night trainmaster, has been appointed assistant trainmaster.

Bernard R. Tolson, who has been appointed manager of the Washington Terminal Company, with headquarters at Washington, D. C., was born on August 25, 1883, in Washington, D. C., and was educated in the public schools of the District of Columbia, the Corcoran Scientific School, and the National University Law School. He first entered railroad service in 1900 as an assistant ticket agent and stenographer with the Pullman Company. From 1901, to 1907, he held the position of stenographer and chief clerk to the trainmaster with the Pennsylvania. In August, 1907, he became chief clerk to the terminal superintendent of the Washington Terminal Company, with headquarters at Washington, D. C., which position he held until September, 1916, when he was appointed acting superintendent of the same company. In October, 1916, he was promoted to chief clerk of the same company, which position he held until June, 1918, when he became chief clerk to the terminal manager of the Washington Terminal district, under the federal control of railroads. When federal control terminated, Mr. Tolson resumed his position as chief clerk of the Washington Terminal Company, which position he held until the time of his recent appointment as manager.

Traffic

G. J. Browne has been appointed general agent, freight department, of the New York, New Haven & Hartford, with headquarters at Portland, Me.

L. C. Fowler, city ticket agent on the Union Pacific at Riverside, Cal., has been promoted to passenger and freight traffic agent, with headquarters at Redlands, Cal., succeeding **H. P. Parker,** resigned.

H. C. Higgins has been appointed general agent in the freight department of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn.

E. P. King has been appointed general baggage and mail agent and superintendent of dining car service of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, succeeding **Frank J. Moore,** deceased.

Robert S. Wiley, dairy agent of the Erie at New York, has been appointed eastern dairy agent, with headquarters in the Produce Exchange, New York. Edward V. McHugh has been appointed western dairy agent, with headquarters in the Transportation building, Chicago.

W. P. Cox, traveling freight agent on the Missouri-Kansas-Texas, with headquarters at Chicago, has been appointed to the newly created position of general agent for Minnesota, South Dakota, North Dakota, northern Wisconsin and Michigan, with headquarters at Minneapolis, Minn.

Mechanical

M. U. Ward has been appointed road foreman of engines on the Toledo, Peoria & Western.

E. J. Ball, acting superintendent of shops of the New York, New Haven & Hartford, with headquarters at Van Nest, N. Y., has been appointed superintendent of shops, with the same headquarters.

Special

H. M. Williams has been appointed safety instructor of the Missouri Pacific, with headquarters at St. Louis, Mo.

W. H. Mooney, claim agent on the Wichita division of the Missouri Pacific, with headquarters at Wichita, Kan., has been appointed assistant superintendent of safety, with headquarters at St. Louis, Mo.

Obituary

P. J. Meade, master mechanic of the Atlantic Coast Line, with headquarters at Wilmington, N. C., died in that city on September 30, 1926.

J. Irwin, superintendent of the Prince Albert division of the Canadian National, died at his home in Prince Albert, Sask., on September 25.

Charles A. Forrest, formerly executive general agent on the St. Louis-San Francisco, with headquarters at Birmingham, Ala., died on September 25, at Atlanta, Ga.

Edward W. Grice, assistant to the president of the Chesapeake & Ohio, with headquarters at Richmond, Va., died in that city on September 29, 1926. Mr. Grice first entered railroad service in 1880 as a telegrapher with the Wabash, St. Louis & Pacific (now a part of the Wabash). From 1880 to 1885, he served consecutively as a freight clerk and train dispatcher, and from 1885 to 1888 as chief train dispatcher with the Louisville, Evansville & St. Louis (now a part of the Southern). From 1888 to 1889 he held the position of chief train dispatcher with the Louisville & Nashville. In 1889, Mr. Grice became chief train dispatcher of the Pittsburg & Western (now a part of the Baltimore & Ohio). In 1890 he went with the Chesapeake & Ohio as chief train dispatcher, which position he held until 1898 when he was promoted to trainmaster. On January 1, 1901, he was promoted to division superintendent, Clifton Forge division, with headquarters at Clifton Forge, Va., holding this position until July, 1903, when he was transferred as division superintendent to the Huntington division, with headquarters at Hinton, W. Va. On July 1, 1906, he was promoted to general superintendent, with headquarters at Hinton, W. Va., which position he held until May, 1910, when he was promoted to general manager of the same railroad and the Chesapeake & Ohio of Indiana. In July, 1912, he was promoted to assistant to the fourth vice-president of the Chesapeake & Ohio and the Hocking Valley, holding this position until January, 1915, when he was appointed assistant to the president of the Chesapeake & Ohio, which position he held until his death.